COGNITIVE PENETRABILITY AND THE EPISTEMOLOGICAL SIGNIFICANCE OF ETIOLOGY

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COGNITIVE PENETRABILITY AND THE EPISTEMOLOGICAL SIGNIFICANCE OF ETIOLOGY

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Abstract In this three-paper dissertation, I explore the epistemological implications of cognitive penetrability, the possibility that our beliefs, expectations, and other mental states can causally influence our perceptual experiences.

In the first paper, I reject an important view in the epistemology of perception called "dogmatism" from the epistemology of imagining. Dogmatism claims that for any experience (perceptual, memorial, imaginative etc.), if it has a distinctive kind of phenomenal character—namely phenomenal force, then it justifies beliefs about the external world. I argue that recent empirical work shows that some imaginings can also have phenomenal force, but they fail to justify. So dogmatism is false.

In the second paper, I argue that some cognitively penetrated experiences fail to justify due to their inappropriate etiology. I first defend Macpherson's psychological mechanism of cognitive penetration, according to which imagining plays an important role. Then I argue that some experiences resulting from this mechanism fail to justify because of the role imagining plays. I argue that imagining-perception interaction can also take the form of facilitation, so our approach can explain various innocent cases of cognitive penetration.

In the third paper, I reject an alternative way of explaining the epistemological implications of cognitive penetration called "inferentialism." Inferentialism holds that perceptual experiences can result from inferences and that the justificatory power of perceptual experiences can be influenced by the quality of inferences leading to them. I challenge inferentialism from a currently blooming empirical project, which analyzes perceptual experiences in terms of Bayesian inferences. I argue that this view threatens to be skeptical when applied to Bayesian perceptual inferences, so we should reject it.

BIOGRAPHICAL SKETCH

Lu Teng is a PhD student in philosophy at Cornell University. Her primary research interests are in epistemology and the philosophy of mind. She is also competent in teaching applied ethics, political philosophy, and Chinese philosophy. Before attending Cornell, she received her Bachelor's degree in philosophy from Wuhan University in China. She visited Calvin College for a year after graduating from Wuhan. She also visited Harvard University for a year to conduct her thesis research during her PhD study.

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CHAPTER 1

IS PHENOMENAL FORCE SUFFICIENT FOR IMMEDIATE PERCEPTUAL JUSTIFICATION?

Introduction

Many philosophers now agree that perceptual experiences can provide us with justification for beliefs about the external world. What is still in dispute is: what kind of justification can perceptual experiences provide—for example, can they provide immediate justification, which is independent of any justification for other beliefs? And in virtue of what do they provide such justification if they do at all? An important view in the epistemology of perception—the view that will be called "dogmatism" in this paper—adopts the following two theses with respect to these questions:

> **The Immediacy Thesis:** Perceptual experiences provide us with immediate justification for beliefs about the external world.
>
> **The Phenomenal Thesis:** For any experience (e.g., perceptual, memorial, imaginative, etc.), if it has a distinctive kind of phenomenal character, then it thereby provides us with immediate justification for beliefs about the external world, where the phenomenal character of an experience is "what it is like" to undergo the experience.[1]

Dogmatism is an important view partly because it promises to relieve us from a skeptical worry, which maintains that we need justification to rule out skeptical

[1] Adherents of dogmatism include Bengson (2015), Chudnoff (2011, 2012, 2013, and forthcoming), Huemer (2001, 2006, and 2007), Lycan (2014), Pryor (2000 and 2004), Silins (2014), Skene (2013), and Tucker (2010 and 2014). Some philosophers use "dogmatism" to only refer to the Immediacy Thesis, but Tucker (2014) points out that it is the Immediacy Thesis together with the Phenomenal Thesis that "captures the usage that is most prevalent in the minds of epistemologists" (p. 2). That is also how I use the term in this paper.

scenarios in order to have justified beliefs about the external world.[2] According to the Immediacy Thesis, perceptual experiences provide us with justification for beliefs about the external world without relying on any of our justification for other beliefs, so we do not need to reject the skeptical scenarios in order to have justified beliefs about the external world. Moreover, dogmatism promises to solve the regress problem, which challenges us to explain how we justify some beliefs based on other beliefs without slipping into an infinite regress of justification.[3] By claiming that perceptual experiences provide us with immediate justification, dogmatism makes perceptual experiences a basic source of justification and secures that our beliefs can be ultimately supported by our perceptual experiences.

The above theoretical advantages of dogmatism derive mainly from the Immediacy Thesis. Dogmatism is unsatisfying if there is no explanation of where the justificatory power of perceptual experiences comes from. The Phenomenal Thesis offers such an explanation: perceptual experiences provide immediate justification in virtue of having a distinctive kind of phenomenal character, and having such phenomenal character is sufficient for perceptual experiences to provide immediate justification. However, in principle, the Immediacy Thesis and the Phenomenal Thesis can come apart since one can accept the former while rejecting the latter. One might think that perceptual experiences provide us with immediate justification, but not in virtue of having a distinctive kind of phenomenal character. Instead, they do so in virtue of having an appropriate etiology, such as being produced by a reliable process.[4]

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[2] See Huemer (2001) and Pryor (2000 and 2004).
[3] See Huemer (2001).
[4] Goldman (2008) and Lyons (2009) hold this view.

Or they do so in virtue of having a distinctive kind of phenomenal character as well as having an appropriate etiology.

In this paper, I will argue against dogmatism by rejecting the Phenomenal Thesis. I will grant that the Immediacy Thesis is true. In particular, I will argue that some empirical studies show that imaginings can have the distinctive phenomenal character dogmatists have in mind, but some of the imagings fail to provide us with immediate justification for beliefs about the external world at least partly due to their inappropriate etiology. Only experiences that are "given" to us can provide us with immediate justification. The imaginings at issue are not what are given to us but rather what we fabricate for ourselves, so they fail to provide us with immediate justification for the relevant beliefs about the external world. Such imaginings constitute counterexamples to the Phenomenal Thesis and hence to dogmatism.

Here is the plan for the discussion. In section 1.1, I will say more about dogmatism. In section 1.2, I will offer a detailed analysis of the distinctive phenomenal character dogmatists have in mind. In section 1.3, I will introduce the empirical studies, dismiss alternative explanations of them, and then pave the way for the subsequent epistemological discussion by considering what kind of imaginings are suitable for having the distinctive phenomenal character. In section 1.4, I will present the argument against dogmatism by rejecting the Phenomenal Thesis from the epistemology of imagining. In section 1.5, I will consider and reply to some objections.

1.1 More Clarification on Dogmatism

Let's focus on a more specific version of the Phenomenal Thesis:

> **The Phenomenal Thesis:** For any experience (e.g., perceptual, memorial, imaginative, etc.), if it has a distinctive kind of phenomenal character—namely phenomenal force—with respect to its content that P, then it thereby provides us with immediate prima facie justification for believing that P.

Several things need to be said about this thesis. To begin with, it assumes the "content view" of perceptual experiences, according to which perceptual experiences have propositional contents that are true or false.[5] It also assumes that perceptual experiences can share the same contents with beliefs. There is a debate in the philosophy of perception about whether perceptual experiences can represent "high-level" properties, such as being a hand, in addition to "low-level" properties, such as color, shape, and volume.[6] For the sake of discussion, I will assume that perceptual experiences can represent high-level properties.[7]

Second, the phenomenal character of an experience is "what it is like" to undergo it. For example, what it is like to see a dog is different from what it is like to see a flower, which is also different from what it is like to smell a flower. Moreover, what it is like a see a flower from a near distance is different from what it is like to see it from a far distance. These are differences in the phenomenal character of perceptual experiences. According to the Phenomenal Thesis, when a perceptual experience provides us with immediate justification for believing that P, it does so by having a distinctive kind of phenomenal character with respect to the proposition that P.

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[5] For recent defenses of the content view, see Byrne (2009), Pautz (2010), and Siegel (2010 a and b).
[6] For defenses of the view that perceptual experiences only represent low-level properties, see Clark (2000), Dretske (1995), and Tye (1995). For defenses of the view that perceptual experiences can also represent high-level properties, see Peacocke (1992), Siegel (2006), and Siewert (1998).
[7] Our rejection of dogmatism does not depend on the last assumption. If perceptual experiences only represent low-level properties, then the Phenomenal Thesis is about how perceptual experiences justify beliefs about low-level properties. We can instead focus on such beliefs in our argument against dogmatism.

Dogmatists call such phenomenal character "phenomenal force," but they are usually vague about what phenomenal force consists in, and I will discuss this in more detail in the next section.

Third, the Phenomenal Thesis claims that the justification provided by perceptual experience is prima facie and immediate. It is prima facie because it can be defeated by additional evidence. For example, having a visual experience that it is raining provides you with prima facie justification for believing that it is raining, but if you later learn that you were actually hallucinating, it can defeat the justification you acquire from your visual experience and prevent you from having all-things-considered justification. The relevant justification is immediate because it does not depend on any justification you have for other beliefs. In the current example, you have justification for believing that it is raining without depending on your justification for other beliefs, such as the reflective belief that you are having such an experience or the belief that your visual experience is generally reliable.

Finally, epistemologists usually distinguish between propositional justification and doxastic justification. Here is a rough characterization: propositional justification is about having good reason for believing a proposition, and doxastic justification focuses on using the good reason properly to form and maintain a belief. Suppose that both you and I see that it is raining. Whereas you believe that it is raining based on your visual experience, I believe so out of wishful thinking. We both have propositional justification because we both have good reason from our visual experiences for our beliefs, but only you have doxastic justification because only you use the reason properly to form your belief. The Phenomenal Thesis is primarily

concerned with propositional justification. I will use the same notion in this paper.

1.2 Phenomenal Force

Dogmatists think that perceptual experiences provide us with immediate justification by having phenomenal force. But what does phenomenal force consist in? In this section, I offer a detailed analysis of dogmatists' account of phenomenal force. Let me say something about what an account of phenomenal force needs to do for dogmatism. First, it needs to distinguish perceptual experiences from other mental states, such as beliefs and deliberate imaginings, which are thought incapable of providing us with immediate justification for *non-modal* beliefs about the external world (non-modal beliefs about the external world are in contrast with modal beliefs about the external world. An example of the former is "There is a desk," and an example of the latter is "It is possible that there is a desk").[8] If phenomenal force turns out to be something that beliefs and deliberate imaginings also have, then it is arbitrary to claim that only perceptual experiences provide us with immediate justification.[9] Second, a satisfactory account of phenomenal force also needs to elucidate why having phenomenal force makes perceptual experiences provide immediate justification.

In discussing their view, most dogmatists provide at least some remarks on what phenomenal force consists in, but their remarks tend to mix two accounts together. One account seems to appeal to the "assertiveness" of perceptual experiences:

[8] Kind (forthcoming) argues that some imaginings can provide us with justification for non-modal beliefs about the external world. My view in this paper is not necessarily contradictory to this view. I will explain it more in the final section, where I consider possible objections to my argument.
[9] Ghijsen (2014) calls this the "distinctiveness problem."

> To have this justification for believing p, you need only have an experience that represents p as being the case. (Pryor 2000, p. 519)
>
> The reason lies in what I call the 'forcefulness' of perceptual experiences: perceptual experiences represent their contents as actualized; states of merely imagining do not. (Huemer 2001, p. 77)
>
> Apprehensions [such as perceptual experiences and beliefs]… represent their contents as actualized. This feature I refer to as their "assertiveness," based on the following analogy to sentences. (Huemer 2001, p. 53)
>
> What distinguishes seemings from other experiences is their peculiar phenomenal character. Huemer (2001: 77-9) refers to this character as 'forcefulness' but I prefer the name 'assertiveness.' (Tucker 2010, p. 530)

In these passages, dogmatists seem to take phenomenal force as analogous to assertion in testimony (Pryor also endorses this analogy, which I discuss in a footnote).[10] Consider the following four sentences: "Is there a desk in front of you?" "Make sure that there is a desk in front of you!" "Suppose that there is a desk in front of you." and "There is a desk in front of you." Although all of them are about there being a desk in front of you, the first sentence asks whether that is the case, the second one commands that being the case, the third one assumes that being the case, and only the last one *asserts* that being the case. Phenomenal force, on the current account, is something similar to the assertiveness of the last sentence.

As mentioned earlier, a satisfactory account of phenomenal force needs to distinguish perceptual experiences from beliefs and deliberate imaginings, otherwise it fails to explain the justificatory power of perceptual experiences—namely perceptual

[10] Pryor (2004, fn. 23) cites Heck (2000, pp. 508-509). Here is a quote from Heck (2000, p. 508): "[A]s different as perception may be from belief…, there is yet something similar: Both purport to represent how the world is; both, we might say (borrowing some terminology from the philosophy of language) have assertive force…. Although the comparison with testimony can be misleading if not treated with care… we might say perception is more like a little voice saying, 'There is a desk in front of you.'"

experiences provide us with immediate justification, whereas beliefs and deliberate imaginings do not. Although assertiveness distinguishes perceptual experiences from deliberate imaginings, it does not distinguish perceptual experiences from beliefs. Beliefs are also assertive. For example, the belief "There is a desk in front of you" also represents its content assertively. However, beliefs do not provide us with immediate justification for other beliefs about the external world. (Heck, whom Pryor cites, also makes such a point. I discuss this in a footnote)[11]

Sometimes dogmatists seem to have a more specific kind of assertiveness in mind when discussing phenomenal force, which further distinguishes perceptual experiences from beliefs:

> I think there is a distinctive phenomenology: the feeling of seeming to ascertain that a given proposition is true. This is present when the way a mental episode represents its content makes it feel as though, by enjoying that episode, you can thereby just tell that that content obtains…. But it's not present in every representational mental episode. When you daydream or exercise your visual imagination, you represent propositions (the same propositions you represent when you perceive), but it does not feel as though you can thereby just tell that those propositions are true. (Pryor 2004, p. 357)

> The phenomenology of a seeming makes it feel as though the seeming is "recommending" its propositional content as true or 'assuring' us of the content's truth. (Tucker 2010, p. 530)

The idea here seems to be that perceptual experiences represent their contents in such a way that they *assure* the subjects of their contents' truth. As "assert" in the first account of phenomenal force is understood metaphorically, "assure" here is also

[11] After arguing that perceptual experiences and beliefs are both assertive, Heck (2000, p. 510) goes on to write: "But I am not suggesting that all the epistemological problems about the perceptual justification of belief will vanish if we treat perceptual states as presentational [as assertive]. I am suggesting that, once the presentational aspect of perceptual experience has been properly recognized, the problems that remain concern how, or under what circumstances, a given perceptual experience justifies a beliefs; that the problems that remain are similar to the problems about how, or under what circumstances, beliefs justify other beliefs…."

understood metaphorically. Consider the visual experience of a desk and the belief about a desk again. According to the current account, the visual experience represents the content in such a way that it assures us that there is a desk, whereas the belief fails to do so. We might have this feeling of assuredness when our belief is formed on the basis of a visual experience, but strictly speaking, the assuredness is not from our belief but from our visual experience. Given that assuredness promises to further distinguish perceptual experiences from beliefs, it seems to be a better candidate for phenomenal force than assertiveness.[12]

So far, we have explained dogmatists' account of phenomenal force. Why is having phenomenal force epistemically significant? Why does having phenomenal force make perceptual experiences provide us with immediate justification? Some dogmatists contend that when our experience has phenomenal force with respect to the proposition that P, from our point of view, our experience assures us that P. If we have no special reason to doubt the reliability of the experience, then we at least have some reason to believe that P.[13] Dogmatists sometimes press the following questions to support their view: what is reasonable to believe when our experience has phenomenal force with respect to the proposition that P and we have no defeaters for it? Is it reasonable to suspend judgment or disbelieve our experience for no good reason?

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[12] Realizing the problem of the assertiveness account, Bengson (2015) argues that perceptual experiences are not only assertive, but also "presentational," where he describes presentation as "a conscious state or event that… directly and immediately presents the world as being a certain way" (p. 2). Although Bengson does not fully spells out the metaphor of direct and immediate presentation, he does at one place say the following things about the presentationality of intuitions, which he compares with the presentationality of perceptual experiences: "the presentationality of intuition is arguably clearest in the case of basic logical and mathematical theorems, which, as Kurt Gödel famously observed, sometimes 'force themselves upon us as being true'" (p. 11). This shows that Bengson also takes perceptual experiences to represent their contents in such a way that the experiences assure the subjects of the contents' truth.

[13] See Bengson (2015), Huemer (2001), and Tucker (2014).

They argue that neither suspending judgment nor disbelieving seems reasonable, and the only reasonable attitude is to take our experience at face value.[14]

1.3 Imaginings with Phenomenal Force

In the introduction, I pointed out that if we can show that some experiences have phenomenal force but fail to provide us with immediate justification, then we can show that the Phenomenal Thesis and hence dogmatism are false. In the rest of this paper, I present such an argument. In this section, I argue that it is possible for imaginings to have phenomenal force. In the next section, I argue that some imaginings with phenomenal force fail to provide us with immediate justification for non-modal beliefs about the external world.

So far, I have been relying on our common understanding of what imaginings are. Before proceeding to argue that imaginings can have phenomenal force, I think that it is helpful to make some clarification on what I mean by "imagining." This term is used in many different ways in philosophy and other areas.[15] Here I use it to designate perception-like experiences that are not caused by the appropriate external stimuli. To say that imaginings are not caused by the appropriate external stimuli is not to say that no external stimuli play any causal role at all in the generation of imaginings. When it is not raining and we imagine seeing rain, our imaginings is not caused by the appropriate external stimuli—rain. But other external stimuli, such as black clouds and swaying trees, can nonetheless play some causal role in our having the imagining.

[14] See Huemer (2001) and Tucker (2014).
[15] For different uses of "imagining," see Gendler (2011) and Kind (2013).

Moreover, imaginings can be caused by our cognitive states, such as beliefs and expectations. For example, our expectation that it will rain can cause us to imagine seeing rain; our suspicion that our safety is in danger can cause us to imagine hearing a gunshot. These are the kind of imaginings I will focus on in my rejection of dogmatism. Another distinction is between deliberate imagings and spontaneous imagings. While some imaginings are caused deliberately, other imaginings arise spontaneously and just pop into our mind, such as in the case of daydreaming.[16] As we will see later in this section, spontaneous imaginings seem more suitable for having phenomenal force than deliberate imaginings.

To argue for the possibility that imaginings can have phenomenal force, I first draw your attention to a recent argument of Ghijsen (2014) and Siegel and Silins (forthcoming) that perceptual experiences can lack phenomenal force. The argument is based on a classic experiment conducted by C. W. Perky (1910). Although the argument does not directly show that imaginings can have phenomenal force, it shows that perceptual experiences can be confused for imaginings due to lack of phenomenal force, and hence leads naturally to the question whether the confusion could occur in the reverse direction, in which imaginings are confused for perceptual experiences due to having phenomenal force. I will argue that the confusion can occur in the reverse direction and this shows that imaginings can have phenomenal force.

In Perky's experiment, the participants were asked to imagine a few objects, such as a banana, and a leaf, while unbeknownst to them, faintly colored shapes of those objects were projected onto the screen where they were fixated. The projected

[16] See Walton (1990) for a similar distinction between deliberate imaginings and spontaneous imaginings.

shapes influenced the participants' experiences—for example, they reported having an image of an elm leaf when an elm leaf was shown on the screen, and they reported having an image of a vertically oriented banana when a vertically oriented banana was shown on the screen. However, the participants claimed that they were just imagining. A natural explanation is that they saw those projected shapes, but their visual experiences lacked phenomenal force perceptual experiences usually have. That is why they mistook their visual experiences for imaginings, which usually lack phenomenal force.

However, this explanation is not uncontroversial. An alternative explanation is that the participants' visual experiences of the projected shapes had phenomenal force, but they failed to distinguish those experiences from imaginings. According to our analysis in the previous section, the phenomenal force of an experience probably consists in that the experience represents its contents in such a way that it assures the subject of its contents' truth. Perky pointed out that almost all the participants expressed great surprise or even indignation when asked whether they were certain that they imagined all the things that they reported (see Perky 1910, p. 431 and p. 433). This suggests that the participants' experiences lacked phenomenal force—if their experiences had phenomenal force, why would they confidently take their experiences as imaginative? So we have reason to dismiss this alternative explanation.

Following Perky, S. J. Segal conducted similar experiments to study the relationship between perceptual experiences and imaginings (see Segal 1971 and 1972, Segal and Fusella 1969 and 1970, and Segal and Gordon 1969), but she argued that what happened was that imagining reduced the participants' detection sensitivity: in

imagining what they were told to do, the participants only had unconscious perceptions of the projected shapes on the screen, which were somewhat assimilated into their imaginings. Based on these findings, one might think that Perky's experiment should not be understood as that the participants' visual experiences lacked phenomenal force, but rather that they failed to have conscious visual experiences in the first place.

In reply to this objection, I point out that there is an important difference between the set-up of Perky's experiment and that of Segal's experiments. While Perky had the shapes projected on to the screen before the participants successfully called up imaginings, Segal had the shapes projected only after the participants had successfully called up imaginings.[17] It is plausible that Perky's participants had seen the projected shapes before the interference of imagining kicked in. Moreover, there is empirical evidence that imagining can facilitate perceiving (see Farah 1985 and 1989, Ishai and Sagi 1995 and 1997, Michelon and Koenig 2002, Michelon and Zacks 2003, and Pearson et al 2008), so it might even be questionable whether Segal's participants only unconsciously perceived the projected shapes.

If Perky's experiment demonstrates that perceptions can be mistaken for imaginings due to lack of phenomenal force, could there be cases in which imaginings are mistaken for perceptions due to the presence of phenomenal force? As I see it, C. E. Seashore carried out experiments to produce such imaginings (see Scripture 1896

[17] Perky described the relevant part of her experiment as: "As soon as the description (of the images) was begun, the attention of the observer was distracted from the window by some indifferent question…and at the same moment the experimenter signaled the dark room for the *turning out* of the lantern-lamp or the swinging into place of the solid black screen." (Perky 1910, p. 431, italics mine) Contrast this with Segal's description of the relevant part of her experiments: "Next, the subject was asked to image something, and as soon as he signaled that he 'had' an image, the projector was *turned on*." (Segal 1971, p. 82, italics mine)

and Seashore 1895. For more recent experiments that were similar to Seashore's, see Davies et al. 1982, Ellson 1941 a and 1941 b, and Hefferline et al. 1971. See Bentall 1990 for a brief history of such experiments). In one experiment, the participants were asked to walk slowly toward a white ring where a blue bead was suspended, and were asked to check their distance from the white ring once they detected the bead. After some trials, the bead was secretly removed, but the participants still reported seeing the bead when they walked past the usual distance.

One explanation of Seashore experiments is that after a few trials, the participants formed expectations about what they would perceive when certain external conditions were met. When those conditions were apparently met in the subsequent trials, their expectations triggered them to imagine with phenomenal force the relevant stimuli, despite that the stimuli were not there. Seashore himself endorsed this explanation, and so did Caver-Lemley and Reeves (1992).[18]

As before, one might argue that an alternative explanation is that the participants' imaginings lacked phenomenal force, but they failed to distinguish their imaginings from perceptions, which usually have phenomenal force. However, according to Seashore's report, the participants were hardly convinced when informed about the experiments afterwards. One participant even said that he had a distinctive experience

[18] Seashore (1895) wrote: "The fact that the experimenter performed apparently the same manipulations that in the preparatory trials had produced a distinct sensation, formed the definite suggestion that, since the conditions were *in toto* repeated, the resultant sensation would recur in the same time and manner as before. By force of a firm expectant attention, caused by this inference, the image of the sensation realized itself into the peripheral organs. And in the positive instances, the observer felt it just as he expected to feel it, although there was no physical stimulus." (p. 32) "They [the participants] knew when, where, and how to see the bead, and this was sufficient to project the mental image into a realistic version." (p. 47) Caver-Lemley and Reeves (1992) also mentioned the same explanation of Seashore's experiments: "Scripture's [Seashore's] subjects, expecting to see the bead, might have unwittingly imagined it." (p. 635)

of the absent stimulus, although he was suspicious of the experiment before participating in it (see Seashore 1895, p. 32). This supports that the participants' imaginings had phenomenal force.

Another alternative explanation is that the participants' experiences were not caused by their cognitive-level expectations, but by some mechanic subpersonal-level processes. Given that I will focus on imaginings that are caused by our cognitive states in my argument against dogmatism, I need to say something to reply this alternative explanation.

Ellson (1941 a and 1941 b) conducted experiments similar to Seashore's, in which the participants were asked to detect a tone after seeing a signal light. In one experiment, the participants first performed the task without knowing that later the tone would not appear after the signal light appeared. Then they performed the task again with such knowledge. Fewer participants heard the tone in the latter trials than in the former trials, which suggests that the participants' cognitive-level expectations affected their experiences. Moreover, both Seashore's experiments and Ellson's experiments employed a classical (Pavlovian) conditioning model to generate experiences. Research showed that conditioning relies heavily on cognitive-level expectations (See Bentall 1990, Brewer 1974, Kirsch et al. 2004, Rescorla 1988 and 1991, and Tolman 1932 and 1948).

One might point out that even if the cognitive explanation is true, it remains an open question whether the participants' experiences of the absent stimuli were imaginative or not. Recently, some psychologists and philosophers have argued that our cognitive states can influence our perceptual experiences—they have called such

top-down effects "cognitive penetration."[19] It is possible that in Seashore's experiments, the participants' expectations did not cause them to have imaginings of the absent stimuli, but rather caused them to have visual experiences of the absent stimuli by cognitive penetration. This possibility undermines our claim that it was the participants' imaginings that had phenomenal force.

I have to acknowledge that this is a powerful objection. To it, I reply that although we have not dismissed the alternative explanation from cognitive penetration, we also have not been offered any convincing argument that the experiences were not imaginings. Davies et al. (1982) employed a classical conditioning model to generate experiences too, but they argued that their participants had visual experiences rather than imaginings. They pointed out that according to Segal's findings (which we discussed when considering the alternative explanations to Perky's experiment), imagining tended to reduce detection sensitivity and to be disrupted by verbal description. Since Davies et al. did not observe such effects in their experiments, they rejected that the experiences were imaginings.

However, Davis et al.'s argument was unsatisfactory. First, as we mentioned earlier, there also has been empirical evidence that imagining could facilitate perceiving, so whether the participants' detection sensitivity was reduced was not really a reliable indicator of whether the participants were imagining. Second, Segal asked the participants to deliberately imagine various objects. Even if her experiments

[19] For some defenses of cognitive penetrability, see Cecchi (2014), Churchland (1988), Hohwy (2013), Macpherson (2012), and Vetter and Newen (2014). For rejections, see Deroy (2013), Firestone and Scholl (2015), Fodor (1984 and 1988), Pylyshyn (1999), and Raftopoulos (2001). For further discussions on the issue, see the anthology *The Cognitive Penetrability of Perception: New Philosophical Perspectives*, edited by Zeimbekis and Raftopoulos (2015).

showed that deliberate imagining tend to be interrupted by verbal description, they did not show that spontaneous imagining also tend to be so interrupted. If spontaneous imagining does not tend to be interrupted by verbal description, then not observing such interruption also does not show that the participants were not imagining. For these reasons, I don't think that the imagining explanation of Seashore's experiments has been refuted.

So far, I have argued that phenomenal force might not be universal among all perceptual experiences and can be present in imaginings. Before ending this section, I want to say something about what kind of imaginings can have phenomenal force. First of all, I think that spontaneous imaginings are more suitable for having phenomenal force than deliberate imaginings. Consider the blue bead case again. If the participants' imagining had phenomenal force, then an important reason seems to be that the participants' imagining arose spontaneously and the participants were unaware that their expectation was the cause. On the other hand, when we deliberately imagine something, we are usually aware that the source of our experience is from within. This seems to be a major reason why deliberate imaginings lack phenomenal force.

Second, some dogmatists seem to think that the vivacity and specificity of an experience can influence the phenomenal force of the experience.[20] What those dogmatists have in mind should not be that if an experience is highly specific and vivid then it has phenomenal force, otherwise it does not have phenomenal force. For some perceptual experiences are not so vivid or specific, such as the perceptual experiences of people with poor eyesight, but those perceptual experiences can still

[20] See Bengson (2015)

have phenomenal force. On the other hand, some imaginings are very vivid and specific, such as the imaginings of people who are good at calling up eidetic mental images, but those imaginings can still lack phenomenal force. Such considerations show that vivacity and specificity does not determine whether an experience has phenomenal force.

But what do those dogmatists have in mind? As I see it, they have in mind that once an experience has phenomenal force with respect to some content, specificity and vivacity can influence the strength of the phenomenal force with respect to that content. Compare two visual experiences of the same book: one is had by a person with poor eyesight and only represents the shape of the book, whereas the other is had by a person with good eyesight and represents not only the shape of the book, but also the title and author of the book, its being on a wooden bookshelf, etc. If both experiences have phenomenal force with respect to "There is a book," the phenomenal force seems stronger in the good-eyesight experience than the poor-eyesight experience. It follows from such a view that when imaginings have phenomenal force, specificity and vivacity can also influence the strength of the phenomenal force.

However, such a view is controversial since one might think that phenomenal force is an on/off thing: your experience either represents some content with phenomenal force or it does not. According to this alternative view, the two book experiences above have just as much phenomenal force with respect to "There is book." What distinguishes between them is that the good-eyesight experience in addition has phenomenal force with respect to various other propositions, such as "The book is on a

bookshelf," "The title of the book is…" etc.[21] It is beyond the scope of this paper to decide which of these views on phenomenal force is correct. But in case one thinks that specificity and vivacity can make a difference to the strength of phenomenal force, I will consider how specificity and vivacity influence the justificatory power of imaginings with phenomenal force in the next section.

1.4 The Argument against Dogmatism

In this section, I argue that some imaginings with phenomenal force fail to provide us with immediate justification for non-modal beliefs about the external world at least partly due to their inappropriate etiology, so the Phenomenal Thesis and dogmatism are false.

To begin with, consider the following case of deliberate imagining:

> **Deliberate Rain Imagining:** Sam expects that it will rain, so he deliberately imagines seeing rain when he looks out the window. The imagining is not so specific or vivid. Moreover, it lacks phenomenal force with respect to "It is raining." Sam forms the belief that it is raining on the basis of his imagining.

Clearly, Sam does not have immediate justification from his imagining for believing that it is raining. Why? One explanation is that in deliberately imagining the rain, Sam knows that the source of his experience is from within, so he has evidence that he is not seeing the rain. This evidence is a defeater of the justification provided by his imagining for believing that it is raining.[22] According to this explanation, Sam has prima facie justification from his imagining for believing that it is raining, but because he is aware that he is imagining, the prima facie justification fails to constitute

[21] I thank Susanna Siegel and Nico Silins for pressing this point.
[22] See Silins (2014) for discussions of defeaters of experiences.

all-things-considered justification. I do not find this explanation adequate since Sam seems to lack prima facie justification in the first place.

To further support this point, compare Sam with Ted, who wants to get a job and hence forges an offer letter for himself. Apparently, Ted lacks justification for believing that he is offered the job. We can ask whether Ted has prima facie justification from reading the letter for believing that he got the job but his knowledge about his role in creating the letter defeats the justification, or he even lacks prima facie justification in the first place. My intuition is that he even lacks prima facie justification. Suppose that Ted wants to get the job so badly that he writes the letter without being aware that he is doing so, and hence lacks the defeater. It seems to me that he still lacks justification for believing that he got the job—lacking awareness of his role in creating the letter does not make the letter legitimate evidence for him. We need something else than defeaters to explain why this is the case.

The second explanation claims that Sam lacks immediate justification for believing that it is raining due to the poor phenomenal character of his imagining. There are at least two ways to spell this explanation out. On the one hand, one might argue that Sam's imagining is less specific and vivid than an ordinary visual experience of rain. That is why he fails to have immediate justification for believing that it is raining.[23] This view is false. Some visual experiences are no more specific or vivid than some imaginings, but these visual experiences can still have different justificatory power from the imaginings. For example, when someone with poor eyesight sees a book, he can still have immediate justification for believing that there

[23] David Hume famously argues for this view.

is book, whereas when he has a more specific and vivid visual imagining of a book, he can still lack immediate justification for believing that there is book.[24]

On the other hand, one might contend that it is because Sam's imagining lacks phenomenal force that Sam does not have immediate justification for believing that it is raining. The underlying logic of this explanation seems to be that had Sam produced the imagining with phenomenal force, the imagining would have the same justificatory power as an ordinary visual experience of rain. To evaluate this explanation requires us to consider an imagining with phenomenal force. As discussed in the previous section, spontaneous imaginings are more suitable for having phenomenal force than deliberate imaginings. In Seashore's blue bead case, if the participants' imagining of the missing bead had phenomenal force, an important reason seems to be that the imagining arose spontaneously and the participants were unaware that their expectation was the cause.

In light of this analysis, let's consider a spontaneous version of Sam's rain imagining:

> **Spontaneous Rain Imagining:** Sam expects that it will rain. This expectation causes him to spontaneously imagine seeing rain when he looks out the window. The imagining is not so specific or vivid. But partly due to its spontaneity, it has phenomenal force with respect to "It is raining." Sam forms the belief that it is raining on the basis of his imagining.

Does Sam here have immediate justification from his imagining for believing that it is raining? I think not. To see this point, consider Ted the forger again. Suppose that Ted is unfamiliar with the writing style of offer letters and writes one in colloquial English. According to the logic of the above explanation, Ted does not have

[24] See Siegel and Silins (forthcoming).

justification for believing that he is offered the job because the letter is poorly written—it should be composed in more formal English. But had Ted been more familiar with the style of offer letters and forged a letter that looked exactly like an authentic one, I would still doubt that the letter counts as legitimate evidence for him. What goes wrong is not only that the letter falls below a certain quality standard, but also, more importantly, that it is Ted who creates the letter. The deliberate rain imagining case and the spontaneous rain imagining case seem problematic in a similar way: it is Sam's expectation that causes him to imagine seeing rain, so he is not supposed to have immediate justification for believing that it is raining.

I now propose an alternative explanation of the rain imagining cases, which at least partly attributes the lack of justificatory power of Sam's imagining to its inappropriate etiology. We think that ordinary perceptual experiences provide us with immediate justification for beliefs about the external world at least partly because these experiences are what are "given" to us. Although these experiences are often influenced by subpersonal-level states, such as the information stored within our perceptual system, they are substantially different from experiences that are caused by our personal-level states through a semantically intelligible route: the latter are what we fabricate for ourselves, whereas the former are not.[25] Sam's rain imagining, however, is caused by his expectation through a semantically intelligible route, and

[25] The phrase "through a semantically intelligible route" is necessary. One might think that imaginings whose contents bear no intelligible relationship to the contents of their causing cognitive states are more akin to what are given to us (I thank Matthew McGrath for pressing this point). Consider that your expectation to see apples causes you to imagine seeing a cat, or that your expectation that it will rain causes you to imagine seeing tiny people walking on the carpet. One might think that as such imaginings get more and more spontaneous, it becomes more and more vague whether we can attribute the relevant cognitive influences to you rather than to some subpersonal systems. If such imaginings count as what are given to you rather than what you fabricate for yourself, then maybe they can still provide you with immediate justification for non-modal beliefs about the external world.

hence is what he fabricates for himself. No matter what the phenomenal character of the imagining is like, it is not legitimate basic evidence for him that it is raining (by "basic evidence," I mean evidence that provides one with immediate justification), just as Ted's offer letter, which is what Ted fabricates for himself, is not legitimate evidence for Ted that he got the job.[26]

Now we have seen that the spontaneous rain imagining case constitutes a counterexample to the Phenomenal Thesis and hence to dogmatism. This case shows that having an experience with phenomenal force is insufficient for having immediate justification for the relevant non-modal beliefs about the external world.

Finally, let's consider whether specificity and vivacity can influence the justificatory power of imaginings with phenomenal force. Suppose that specificity and vivacity can make a difference to the strength of phenomenal force. Dogmatists might construe the relationship between the strength of immediate justification and the strength of phenomenal force in two ways. On the one hand, they might take the strength of immediate justification as proportionate to the strength of phenomenal force: the stronger the phenomenal force of an experience is, the more immediate justification the experience provides.[27] On the other hand, dogmatists might reject that

[26] In discussing the epistemology of cognitive penetration, McGrath (2013 and 2014) distinguishes between experiences that are "handed" to us and experiences that we "make." He models the epistemic evaluation of the latter experiences on the epistemic evaluation of inferences. Although McGrath barely discusses imaginings and I also prefer a different model to explain cognitive penetration, which I discuss in another paper, I do share with McGrath the idea that experiences we fabricate for ourselves are not supposed to provide us with immediate justification.

[27] Many dogmatists seem to adopt the proportionateness view. Huemer (2007) formulates his principle of dogmatism as: "If it seems to S that p, then, in the absence of defeaters, S thereby has at least some degree of justification for believing that p" (p. 30). Huemer explains in a footnote that he inserts "at least some degree of" into the principle to make it clear that an experience with weak phenomenal force needs not to provide full justification for believing the relevant contents. Tucker (2010) mentions in a footnote that it is plausible that the strength of phenomenal force is "positively correlated" with the strength of justification the experience provides. The most explicit discussion on the proportionateness

the strength of immediate justification varies with the strength of phenomenal force, but instead take all experiences with phenomenal force to provide us with the same amount of immediate justification.[28] Either way, they adhere to the basic idea of the Phenomenal Thesis that phenomenal force is sufficient for immediate justification.

Once we clarify that the inappropriate etiology of Sam's imagining at least partly prevents the imagining from providing him with immediate justification, it is not difficult to argue that specificity and vividness makes little difference to the justificatory power of the imagining. Suppose that Sam's spontaneous imagining are more vivid and specific and has stronger phenomenal force. As long as the imagining is caused by Sam's expectation through a semantically intelligible route, it would still count as what he fabricates for himself, and hence is not legitimate basic evidence for him that it is raining. More specificity and vivacity might make imaginings with phenomenal force have stronger phenomenal force, but they do not make imaginings have stronger justificatory power.

1.5 Objections and Replies

In this section, I consider and reply to three possible objections to our argument. First, one might argue that if Sam's spontaneous rain imagining has phenomenal force then it is just like a hallucination. But we usually take hallucinations to have the same justificatory power as ordinary perceptual experiences and to provide us with immediate justification for non-modal beliefs about the external world. Therefore,

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view, as far as I can see, is Bengson (2015). He writes: "the gradability of presentations may ground a corresponding gradability in prima facie justification."

[28] I thank Susanna Siegel for pointing out this alternative to me.

Sam's spontaneous rain imagining is not a counterexample to the Phenomenal Thesis or dogmatism.

In reply to this objection, I first point out that it is controversial whether hallucinations have the same justificatory power as ordinary perceptual experiences. Even if some hallucinations have the same justificatory power as ordinary perceptual experiences, this is at least partly because the hallucinations are what are given to the subjects. For example, in the classic version of the brain-in-a-vat (BIV) case, the BIV's hallucinations are triggered by a supercomputer directed by some crazy scientists, so the hallucinations are given to the BIV. This helps explain why the BIV has immediate justification, if it has any, for various beliefs about the external world. However, Sam's spontaneous rain imagining is caused by his own expectation. The imagining fails to provide him with immediate justification for believing that it is raining at least partly because the imagining is what Sam fabricates for himself. It might be the case that on some definitions of hallucination, the imagining counts as a hallucination,[29] but this does not change what justificatory power it possesses.

Second, one might concede that Sam's spontaneous rain imagining is epistemically defective due to its inappropriate etiology, but deny that the imagining is defective in the sense that it fails to provide Sam with immediate justification. One might clarify that having justification for a doxastic attitude consists in being reasonable to adopt the attitude. If Sam's spontaneous rain imagining has phenomenal force with respect to "It is raining," and he has no defeaters to doubt his experience,

[29] A usual definition in psychology takes hallucinations as perception-like experiences that are not caused by the appropriate external stimuli but nonetheless have phenomenal force just like ordinary perceptual experiences do (see Farkas 2013 and Slade and Bentall 1988). On this definition, the spontaneous rain imagining is also a hallucination.

then the reasonable doxastic attitude for him to take is to believe that it is raining—What else could it be? This means Sam's imagining provides him with immediate justification, though the etiology of his imagining prevents him from acquiring some other positive epistemic statuses, such as reliability or knowledge.

In reply, I remind the critic that our argument not only shows that Sam lacks some positive epistemic status, but also shows that what he lacks is immediate justification. I argue that because Sam's imagining is caused by his expectation and counts as what he fabricates for himself, it is not legitimate basic evidence for him to believe that it is raining. If it is not legitimate basic evidence for him to believe that it is raining, then it is not reasonable for him to believe that it is raining merely based on the imagining. Given the close connection between reasonableness and justification, which is emphasized by the critic and which is also what I have in mind when giving our argument against dogmatism, Sam lacks immediate justification for believing that it is raining.

One might still wonder which doxastic attitude Sam is reasonable to take in the spontaneous rain imagining case—whether he only has immediate justification for suspending judgment. I think that the distinction between propositional justification and doxastic justification is relevant to the answer here. To refresh our memory, propositional justification focuses on having good reason for a belief, and doxastic justification focuses on using the reason properly to form and maintain a belief. In the spontaneous rain imagining case, Sam lacks immediate propositional justification for either believing or disbelieving that it is raining because his imagining is not legitimate basic evidence that it is raining or it is not raining. He only has immediate

propositional justification for suspending judgment.

In the spontaneous rain case, Sam forms the belief that it is raining based on the imagining, but since he lacks immediate propositional justification for either believing or disbelieving that it is raining, he also lacks immediate doxastic justification for taking either of these attitudes. Now, if Sam instead suspended judgment, would he then have immediate doxastic justification for doing so? I think that the answer is still "No." Although Sam has immediate propositional justification for suspending judgment, because the etiology of his spontaneous rain imagining is not accessible to him, he is not in a position to use the reason he possesses to suspend judgment. To sum up, if we talk about propositional justification, then Sam has immediate justification for suspending judgment in the spontaneous rain imagining case. If we talk about doxastic justification, then none of belief, disbelief, or suspending judgment is immediately justified for Sam to take.[30]

Finally, one might point out that some deliberate imaginings seem to provide us with immediate justification for non-modal beliefs about the external world. One example is that you try to determine whether a square fits into a circle by imagining placing the former on top of the latter. If your imagining suggests that the square fits into the circle, then it seems to provide you with immediate justification for believing so. Another example is that you try to find out how two colors—let's say a shade of red and a shade of yellow—interact with each other by imagining mixing them on the canvas. If your imagining suggests that the resulting color is a certain shade of orange, then it also seems to provide you with immediate justification for believing so. One

[30] Cf. Jackson (2011), pp. 588-590.

might think that cases like these pose a challenge to our discussion of the epistemology of imagining because they are also what we fabricate for ourselves.[31]

In reply, I argue that the non-modal justification in question is *mediate*, and poses no threat to our view that imaginings do not provide us with immediate justification for non-modal beliefs about the external world. To see this point, it is helpful to consider a different case, in which you are supposed to determine whether a square fits into a circle, but something blocks your vision so you cannot see these figures. With nothing that you can do to remove the block, you instead imagine a random square and a random circle, and imagine placing the former on the top of the latter. Now, even if your imagining suggests that the imagined square fits into the imagined circle, it does not provide you with justification for believing that the blocked square fits into the blocked circle since you do not know whether the blocked figures are of the same sizes as those you imagine. Suppose that later you come to know that they are of the same sizes. You then seem to acquire justification for the belief. But the justification is mediate since it depends on your justification for the new information.

This case sheds some light on how we should understand the non-modal justification involved in the original square-circle case and the color-mixture case. In the original square-circle case, your justification for believing that the square fits into the circle also depends on your justification for believing that the figures stacked by your imagining are of the same sizes as those you see. It is just that you already have

[31] I thank Nico Silins for raising these cases to me. Also, as mentioned in fn. 8, Kind (forthcoming) argues that some imaginings can provide us with justification for non-modal beliefs about the external world.

the latter justification when imagining, whereas in the compared case you do not acquire the justification until later. The same seems true with the color-mixture case. If our understanding is correct, then the original square-circle case and the color-mixture case at best show that imaginings can inferentially justify non-modal beliefs about the external world. But this does not contradict our view that imaginings cannot immediately justify such beliefs.[32]

Conclusion

Dogmatism proposes that for any experience, if it has phenomenal force, then it thereby provides us with immediate justification for external world beliefs. In this paper, I have argued that imaginings can have phenomenal force, but some of them, at least partly due to their inappropriate etiology, fail to provide us with immediate justification for external world beliefs. Only experiences that are given to us are legitimate basic evidence. The imaginings at issue are not what are given to us, but rather what we fabricate for ourselves, so they are not legitimate basic evidence for us that the relevant external world beliefs are true. Such imaginings constitute counterexamples to dogmatism.

One thing I have not done and I would like to do in the future is to offer a positive story of what is sufficient for immediate perceptual justification—for example, whether having a perceptual experience with phenomenal force together with

[32] Spaulding (forthcoming) also rejects that we can gain non-modal knowledge merely though imaginings. Her reason is that imaginings only reveal possibilities, and need to be supplemented with background information in order to produce knowledge about the actual world. This argument further supports that imaginings at best provide us with inferential justification for non-modal beliefs about the external world.

an appropriate etiology is sufficient. Moreover, I granted, for the sake of discussion, that perceptual experiences can provide immediate justification, but this thesis might be contested.

Recently, some philosophers have challenged dogmatism by arguing that some cognitively penetrated perceptual experiences (which I have discussed in section 1.3) have phenomenal force as ordinary perceptual experiences do, but these cognitively penetrated perceptual experiences fail to provide us with immediate justification for external world beliefs (see Ghijsen 2016, Lyons 2011, McGrath 2013 and 2014, Siegel 2012, 2013 a, 2013 b, and forthcoming, Vahid 2014, and Vance 2014). One might wonder how my paper is related to this emerging project. In fact, I argue in another paper that the epistemology of imagining discussed in the current paper helps explain why some cognitively penetrated perceptual experiences fail to provide us with immediate justification. I take my current paper to establish important background for the debate about the epistemology of cognitive penetration.

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CHAPTER 2

COGNITIVE PENETRATION, IMAGINING, AND THE DOWNGRADE THESIS

Introduction

We tend to think that perceptual experiences tell us about what the external world is like without being influenced by our own mind. However, recent philosophical and psychological research indicates that this might not be true: our beliefs, expectations, and other mental states might influence what we experience. This phenomenon is called the "cognitive penetration" of perceptual experience.[1]

Siegel (2012) presents a hypothetical case of cognitive penetration:

> **Anger:** Jill believes that Jack is angry with her. When she later sees Jack, this belief causes her to experience Jack's face as expressing anger, despite the fact that Jack does not have an angry face at all.

Delk and Fillenbaum's 1965 experiment is often regarded as a case in which cognitive penetration actually occurred:

> **Apple:** The participants were presented with pictures of various objects, cut out from a uniform orange paper. Some of these objects were typically red, such as an apple; others were not typically red, such as a mushroom. All of them were shown in front of a background, whose color could be gradually adjusted from yellow through orange to red. The participants were requested to adjust the background until it exactly matched the color of the pictures. Although the apple and the mushroom were cut out from the same orange paper, the participants set the background closer to red for

[1] For some defenses of cognitive penetrability, see Cecchi (2014), Churchland (1988), Hohwy (2013), Macpherson (2012), and Vetter and Newen (2014). For rejections, see Deroy (2013), Firestone and Scholl (2015), Fodor (1984 and 1988), Pylyshyn (1999), and Raftopoulos (2001). For further discussions on the issue, see the anthology *The Cognitive Penetrability of Perception: New Philosophical Perspectives*, edited by Zeimbekis and Raftopoulos (2015).

> the apple than for the mushroom. What happened in this experiment seems to be: the participants' cognition that apple-shaped objects are typically red influenced their visual experience of the apple picture.[2]

What is the epistemological implication of cognitive penetration? Do cognitively penetrated perceptual experiences have the same evidential force as ordinary unpenetrated perceptual experiences do? According to the *Downgrade Thesis*, some cognitively penetrated perceptual experiences are epistemically downgraded in the sense that they give their subjects less justification than unpenetrated perceptual experiences would usually give. For example, in the Anger case, Jill's experience gives her less justification for believing that Jack is angry than an unpenetrated anger experience; in the Apple case, the participants' experience gave them less justification for believing that the apple picture was red-orange than an unpenetrated red-orange apple experience.[3] Several arguments have been proposed to support the Downgrade Thesis, but for reasons that I have no space to spell out, I am not entirely satisfied with them.[4] In this paper, I will offer an alternative argument, which I think works better.

My argument will build on Macpherson (2012)'s psychological mechanism of how some cognitive penetration takes place: imagining plays a significant role in cognitive penetration. I will argue that some imaginings lack evidential force because they are experiences that we fabricate for ourselves. I will apply this epistemology of imagining to cognitive penetration and argue that because of the role that imaginings

[2] For more recent variations of this experiment, see Hansen et al (2006), Olkkonen et al (2008), and Witzel et al (2011).
[3] The phrase "Downgrade Thesis" is from Siegel (2013 a).
[4] For defenses of the Downgrade Thesis, see Ghijsen (2016), Lyons (2011), McGrath (2013 and 2014), Siegel (2012, 2013 a, 2013 b, and forthcoming), Vahid (2014), and Vance (2014). For criticisms of the Downgrade Thesis, see Fumerton (2013), Huemer (2013), and Tucker (2014 a).

play, some cognitively penetrated perceptual experiences are partly fabricated by their subjects. These experiences give their subjects less justification for believing the relevant contents than unpenetrated perceptual experiences would usually give. Given that my approach of defending the Downgrade Thesis draws connections between the epistemology of imagining and that of cognitive penetration, even if the existent arguments for the thesis do succeed, my approach will nonetheless bring a new and interesting perspective to the discussion.

The rest of this paper will proceed as follows. Section 2.1 will say more about cognitive penetration and the Downgrade Thesis. Sections 2.2 and 2.3 will develop a positive account of how cognitive penetration works based on Macpherson's psychological mechanism, and will defend it against some important objections from Deroy (2013). Section 2.4 will present my argument for the Downgrade Thesis from the epistemology of imagining. Section 2.5 will focus on some good cases of cognitive penetration, and will explain why perceptual experiences in such cases give their subjects no less justification.

2.1 Preliminaries

In order to discuss cognitive penetration, we need to clarify what we mean by "perceptual experience" and "cognitive state." In psychology and philosophy, "perceptual experience" usually refers to conscious states that are produced by perceptual processes rather than unconscious states that are produced by those processes. Some examples of the latter are the outputs of the early visual system and blindsight states. As conscious states, perceptual experiences have phenomenal

character in the sense that there is "something it is like" to undergo them. For example, what it is like to see a dog is different from what it is like to see a flower, which is also different from what it is like to smell a flower. Moreover, what it is like a see a flower from a near distance is different from what it is like to see it from a far distance. These differences are differences in the phenomenal character of perceptual experiences.

I will assume the "content view" of perceptual experiences, according to which perceptual experiences are representational and have propositional contents that can be true or false.[5] There is a debate about what contents perceptual experiences can have—whether they can have the same contents as beliefs do. For the sake of discussion, I will assume that perceptual experiences and beliefs can have the same contents.[6] Another relevant debate is whether perceptual experiences can represent "high-level" properties such as being angry in addition to "low-level" properties such as color, shape, and volume.[7] For the sake of discussion, I will assume that they can represent high-level properties. With respect to the relationship between the contents of a perceptual experience and the phenomenal character of a perceptual experience, I will work with the assumption that there can be no change in one without a change in the other.

The other term that needs clarification is "cognitive state." Here I use it to refer

[5] For recent defenses of the content view, see Byrne (2009), Pautz (2010), and Siegel (2010 a and b).
[6] For example, I will assume that perceptual contents, like belief contents, are conceptual. For defenses of this view, see Brewer (1999), Craig (1976), McDowell (1994), Peacocke (1983), and Sedivy (1996). For challenges to this view, see Dretske (1981), Martin (1992), Peacocke (1992 and 2001), and Tye (1995).
[7] For defenses of the view that perceptual experiences only represent low-level properties, see Clark (2000), Dretske (1995) and Tye (1995). For defenses of the view that perceptual experiences can also represent high-level properties, see Peacocke (1992), Siegel (2006), and Siewert (1998).

not only to beliefs, thoughts, knowledge, expectations, but also to other personal-level psychological states that are potential penetrators of perceptual experiences, such as emotions and desires. Generally speaking, cognitive penetration refers to the situation in which two subjects have perceptual experiences with different phenomenal character and contents due to differences in their cognitive states, when the following factors are held fixed: the distal stimuli, the external conditions such as lighting, the conditions of the subjects' sensory organs, and the subjects' focus and spatial attention.[8]

This characterization of cognitive penetration needs further explanation. It is known that cognitive states can influence perceptual experiences by causing some bodily movements or actions. Suppose that I want to visit Boston, and I know that airplanes can take me there. This causes me to open my computer, buy an airplane ticket, and fly to Boston. As a result, I have various perceptual experiences of the city. Moreover, cognitive states can influence perceptual experiences by shifting the subjects' focus and spatial attention. Suppose that during my stay in Boston, I visit Widener Library at Harvard Yard. Recalling my knowledge about the architectural style of the building, I direct my focus and spatial attention to different parts of it, and hence have different perceptual experiences. Actions and the allocation of focus and spatial attention are standard pre-perceptual phenomena.[9] Our discussion does not take cognitive effects on them as cognitive penetration of perceptual experiences.

[8] For similar characterizations, see Macpherson (2012), Siegel (2012), Stokes (2013), and Vance (2014).

[9] For discussions about the allocation of focus and spatial attention being a pre-perceptual phenomenon, see Macpherson (2012), Pylyshyn (1999), and Raftopoulos (2001). For some recent objections to this view, see Mole (forthcoming).

However, there are other kinds of attention than spatial attention. For example, even if we fix our eyes on a location, object-based attention can make some objects at or near that location more noticeable than other objects. Moreover, even if we pay our attention to a particular object, feature-based attention can make some of its properties more noticeable than other properties. Although the allocation of focus and spatial attention occur before perceptual processing, there is evidence that object-based attention and feature-based attention can occur during perceptual processing,[10] and cognitive effects on these kinds of attention can be cognitive penetration of perceptual experiences. In fact, one might think that the Apple case can be a case like this: when the participants saw the apple picture that was orange, their cognition that apple-shaped objects are typically red caused them to attend to the red component within the orange color and to neglect the yellow component; that is why they saw the picture as redder.[11]

Another point about cognitive penetration is that in order for some cognitive influence on a perceptual experience to count as cognitive penetration, the cognitive influence must be semantically intelligible and coherent.[12] Consider a different version of the Anger case, in which Jill's belief that Jack is angry does not cause her to experience Jack's face as expressing anger but instead causes her to have a migraine, which then makes her experience everything as distorted.[13] Or consider a different version of the Apple case, where the participants' cognition about the typical color of

[10] See Cecchi (2014) and Yeh and Chen (1999).
[11] Macpherson (2012) mentions this explanation of the apple case, but as we will see in the next section, her own proposal differs from it.
[12] See Hohwy (2013), Macpherson (2012), and Pylyshyn (1999).
[13] See Macpherson (2012).

apples caused them to have visual experiences of random people rather than to see the apple picture as somewhat redder. Although there are causal connections between the relevant cognitive states and perceptual experiences in these cases, the connections are not semantically intelligible or coherent. I do not count such cognitive influences as cognitive penetration.

Now, I want to say a few words to clarify the Downgrade Thesis, which claims that some cognitive penetration drastically limits the evidential force of our perceptual experiences. This thesis can be formulated more precisely into the following principle:

> **The Downgrade Thesis:** For some cognitively penetrated perceptual experiences, if they are cognitively penetrated to represent that P, then they are epistemically downgraded with respect to believing that P—that is, they give their subjects less justification for believing that P than perceptual experiences that are unpenetrated to represent that P would usually give.

First, the Downgrade Thesis only applies to beliefs about the external world, such as "Jack is angry" and "The apple picture is red-orange," rather than to self-ascriptions of experiences such as "I have a visual experience that Jack is angry" and "It looks that the apple picture is red-orange." Apparently, cognitively penetrated perceptual experiences give us no less justification for the latter kind of beliefs.

Second, the Downgrade Thesis only applies to beliefs that endorse the relevant cognitively penetrated contents. For example, in the Anger case, although Jill's visual experience gives her less justification for believing that Jack's face is angry, it might give her no less justification for believing that Jack is wearing a green polo shirt. In the Apple case, although the participants' visual experience gave them less justification for believing that the apple picture was red-orange, it might give them no

less justification for believing that the apple picture was presented in front of a background.

Finally, the Downgrade Thesis does not claim that all cognitively penetrated perceptual experiences are epistemically downgraded, but only that some are. The consideration is that if perceptual experience is cognitively penetrable, then there might be different psychological mechanisms through which cognitive penetration occurs, and not all of them need to produce epistemically downgraded perceptual experiences. Moreover, even if some psychological mechanisms produce epistemically downgraded perceptual experiences, they need not only produce such experiences. It is possible that one mechanism can produce both epistemically downgraded perceptual experiences and not epistemically downgraded perceptual experiences. In the rest of this paper, I will build on Macpherson's mechanism of cognitive penetration and will bring out its epistemological implications.

2.2 Macpherson's Mechanism of Cognitive Penetration

Macpherson (2012)'s psychological mechanism consists of two steps: in the first step, some cognitive states activate an imaginative experience or an imaginative process that would normally lead to such an experience; in the second step, the imaginative experience or process interacts with the perceptual experience or process to produce an experience that is a mixture of the two experiences or has contributions from both processes. According to this mechanism, what happened in the Apple case was that the participants' cognition that apple-shaped objects are typically red caused them to have an imaginative experience that the apple picture was red or caused an

imaginative process that would normally produce such an experience. The imaginative experience or process interacted with the participants' visual experience that the apple picture was orange or with the perceptual process that would normally produce such an experience, leading to an experience that the apple picture was red-orange.[14]

Macpherson does not say much about what she means by "imaginative experience" or "imaginative process" but she seems to use the former to refer to perception-like experiences that are not caused by the appropriate external stimuli,[15] and seems to use the latter to refer to processes that produce imaginative experiences. She argues that there is independent evidence that each step of her mechanism can occur. First, it is widely illustrated that cognitive states can trigger imaginative experiences or processes. For example, our expectation that it will rain can cause us to imagine seeing rain; our suspicion that our safety is in danger can cause us to imagine hearing a gunshot. However, to say that cognitive states can trigger imaginative experiences or processes is not to say that we must always trigger them deliberately. Some imaginings seem to arise spontaneously and just pop into our mind, such as in the case of daydreaming.[16]

Second, Macpherson argues that the Perky effect shows that an imaginative experience or process can interact with a perceptual experience or process to produce

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[14] Macpherson first characterizes the interaction as one between the participants' imaginative and perceptual experiences, but then she doubts that the participants were aware of more than one phenomenal states, so she rephrases the idea as: "the relevant imaginative and perceptual processes simply produce one state with phenomenal character whose nature has contributions from both the imaginative and perceptual processes" (Macpherson 2012, p. 55).

[15] To say that imaginings are not triggered by the "appropriate" external stimuli is not to say that external stimuli play no triggering role at all in generating imaginings. When it is not raining and we imagine seeing rain, our imagination is not caused by the appropriate external stimuli—namely rain, but other external stimuli, such as black clouds and swaying trees, might nonetheless play some triggering roles in our having the imagining.

[16] For a similar distinction, see Walton (1990).

an experience that is a mixture of the two experiences or has contributions from both processes. C. W. Perky (1910) conducted a series of experiments, in which the participants were asked to imagine a few objects, such as a tomato, a book, a banana, and a leaf, while unbeknownst to them, faintly colored pictures of those objects were projected onto the screen where they fixated. Since Perky made sure that the pictures were above the general visual threshold for the participants, it is plausible that the participants saw the pictures. In fact, the pictures seemed to influence the participants' experiences—for example, the participants reported having an image of an elm leaf when an elm leaf was shown on the screen, and reported having an image of a vertically oriented banana when a vertically oriented banana was shown on the screen. But the participants claimed that they were just imagining. These results were usually taken to show that perceptual experiences could have the same contents or phenomenal character as imaginative experiences.

Consistent with this conclusion, other results of the same experiments showed that some participants called up imaginative experiences or processes, and their resulting experiences were mixtures of their imaginative and perceptual experiences or had contributions from both processes. For example, one participant reported his experiences with both perceptual and imaginative details: "the tomato was seen painted on a can, the book was a particular book whose title could be read, and the lemon was lying on a table, the leaf was a pressed leaf with red markings on it" (Perky 1910, p. 432). If we take this participant's testimony seriously, then his experiences seemed to be amalgams of his visual experiences of the projected pictures—the tomato, the book, the lemon, etc.—and imaginative experiences of various other

details—the can, the book title, the table, etc., or seemed to have contributions from both the perceptual and imaginative processes.

Macpherson does not say much about this, but following Perky, S. J. Segal (1971, 1972) examined whether an imaginative experience or process could assimilate elements from a perceptual experience or process. Based on the results of her experiments, Segal concluded, "assimilation is a real, reliable, and replicable effect" (Segal, 1972, p. 226). Here are two cases crystalized from Segal's experiments:

> **Manhattan:** The participants were asked to imagine a city skyline, while unbeknownst to them, a faint red tomato was projected onto the screen where they fixated. Several participants reported that they had an image of Manhattan at sunset.
>
> **Tomato:** The participants were seated under a vinyl hood and asked to imagine a tomato. They reported the tomato as red when, unbeknownst to them, a faint red tomato was projected onto the surface of the hood, whereas they reported the tomato as "shaded or dirty" red, as "shiny," as a "homegrown" tomato when a faint beer was projected.

In these two cases, both perceptual and imaginative experiences or processes seemed to contribute to the participants' resulting experiences. Cases like these two further indicate that the second step of Macpherson's mechanism—the interaction between perceptual and imaginative experiences or processes—can independently occur.

If perceptual experiences or processes can interact with imaginative experiences or processes, a question to ask is: what is the nature of the resulting experiences? Are they perceptual experiences, imaginative experiences, or amalgams of both? Macpherson is not so interested in which category the resulting experiences belong to. She thinks that what matters the most is that both perceptual and imaginative

experiences or processes contribute to the resulting experiences.[17] However, in order for her mechanism to explain the occurrence of cognitive penetration, it is important that the experiences produced by the mechanism are perceptual experiences. Otherwise, there would be no cognitive penetration in the relevant sense.

Before ending this section, I want to make one more point. Macpherson's mechanism focuses on a particular kind of interaction between imaginative and perceptual experiences or processes—both experiences or processes directly contribute to the content and phenomenal character of the resulting experiences (recall her explanation of the Apple case: the participants' imaginative experience or process contributed a red element, and their perceptual experience or process contributed an orange element, resulting in their red-orange experience). This does not mean that imaginative experiences or processes can only interact with perceptual experiences or processes in the form of direct content and phenomenal contribution. There might be other kinds of interaction between these experiences or processes, through which cognitive penetration could occur and which could be coherently incorporated into Macpherson's mechanism. This point will be critical when we discuss how our approach explains good cases of cognitive penetration in section 2.5.

2.3 Deroy's Objections to Macpherson's Mechanism

[17] When Macpherson discusses the Perky effect, she writes, "What does seem clear is that the phenomenal character of the resulting state—be it an imaginative one, or a perceptual one mistaken for an imaginative one, or some combination of perceptual or imaginative state—has aspects contributed by perceptual and imaginative processes" (2012, p. 53). She takes the assimilation of external stimuli into dreams as another illustration of the interaction between perceptual and imaginative experiences or processes. There she writes, "As with the Perky case, I am not interested in whether it is correct to say that a subject who has, say, the sound of their alarm clock incorporated into their dream, is dreaming of the sound or hearing the sound, or some amalgam of the two" (2012, p. 53).

Deroy (2013) rejects Macpherson's mechanism by drawing our attention to some more recent experiments on color experiences conducted by M. Olkonnen and her colleagues (2008):

> **Banana:** The participants were presented with three versions of fruit pictures: pictures of fruits with surface texture (e.g. a picture of a yellow banana with surface texture), pictures of fruits with no surface texture (e.g. a picture of a yellow banana without surface texture), and mere outline shapes of fruits (e.g. a yellow outline shape of a banana). The participants were asked to set the color of the pictures to grey. As it turned out, they set the color more toward the opposite direction from the fruits' typical color than the standard grey point (e.g. more toward blue for the banana). This suggested that at the point where the pictures were grey, the participants still saw them as closer to the fruits' typical color (e.g. yellower for the banana). But interestingly, the effects were strongest with textured fruit pictures, yet weakest or almost absent with outline shapes (e.g. more toward blue for the textured banana picture than for the untextured banana picture, than for the banana outline shape).

Deroy points out that outline shapes should be no less effective in triggering cognitive states about the relevant fruits than pictures. If the effects on color experiences in the Banana case were cognitive penetration, then they should be more or less the same with all three versions of fruit pictures. However, in the Banana case the effects varied significantly among different versions of fruit pictures, so the effects were probably not cognitive penetration.

Moreover, Deroy thinks that the Banana case reveals a more fundamental problem of Macpherson's mechanism: entertaining the relevant cognitive states is not sufficient for the effects on color experiences to occur. She draws our attention to the fact that we can at least partly decide whether to entertain a cognitive state, but we cannot decide when the effects on color experiences occur or how the effects vary. For

example, we cannot activate the effects by bringing to mind the concept of a banana or beliefs about the typical color of bananas while looking at a circle. Neither can we activate the effects by bringing to mind the concept or beliefs while looking at an outline shape of a banana, as showed by the Banana case above. Therefore, argues Deroy, we need an alternative explanation of the occurrence of and the variation in the effects in the Banana case.

What is an alternative explanation of the effects? Deroy proposes that they are top-down influences within the perceptual system. Following Massaro (1998 and 1999), Deroy embraces the view that when we perceive something, the perceptual system first processes the information from different sensory channels separately and then combines and integrates the information according to "logically optimal decisions." Nonetheless, the logically optimal decisions and sensory integration are affected by "multimodal representations" stored within the perceptual system. For example, there is a multimodal representation of bananas that keeps all the sensory information—such as color, shape, volume, texture, smell, and taste—acquired from perceiving bananas. When we perceive an object with matching properties, this multimodal representation is triggered to influence, from top down, our perception of the object's other properties.

Deroy argues that this mechanism can explain the Banana case: viewing fruit pictures triggered the multimodal representations of the relevant fruits, which consequently influenced the participants' color experience of those pictures. Such effects were automatic because they occurred within the perceptual system. Moreover, since textured fruit pictures and untextured fruit pictures represented more matching

properties with the relevant multimodal representations than mere outline shapes of fruits, they were more effective triggers of the relevant multimodal representations. This explains the variation in the effects on color experiences in the Banana case. Finally, Deroy points out that her mechanism can also explain the absence of such effects for shapes like a circle and a square: there are no multimodal representations that bind these shapes with particular colors, so the effects do not occur for them.

However, I do not think that Deroy has shown that her mechanism is superior to Macpherson's. First of all, it is not clear why outline shapes are less effective triggers of the multimodal representations than fruit pictures—especially in the case of a banana. The reason for which Deroy thinks that having more matching properties with a multimodal representation triggers the multimodal representation more effectively seems to be that different multimodal representations can store overlapped information, and having more matching properties makes it easier to single out a multimodal representation. For example, the multimodal representations of cucumbers, zucchinis, and eggplants can store similar shape information—"cylindrical shape with rounded ends." A picture that only represents this property will be a less effective trigger of the multimodal representation of cucumbers than a picture that in addition represents a warty surface.

However, this does not mean that in order to single out a multimodal representation, there always have to be many matching properties—something might have such a unique property that simply perceiving that property is sufficient to trigger the relevant multimodal representation. Consider that your mother has a unique voice, and whenever you hear it you know that the person who makes it is your mother. Or

consider that MacBook used to have a unique keyboard layout, and whenever you saw a congruent keyboard layout you were certain that the computer was a MacBook. Why couldn't there be parallel cases with respect to triggering multimodal representations? For example, some fruits—such as a banana—are of such unique shapes that merely perceiving the shapes might be enough to trigger the relevant multimodal representations. But then, Deroy fails to convince us that outline shapes are less effective triggers of multimodal representations than textured fruit pictures and untextured fruit pictures, and therefore fails to explain the Banana case.[18]

Not only does Deroy fail to support her mechanism, her objections to Macpherson's mechanism also do not stand up to scrutiny. Deroy takes Macpherson to commit to the idea that merely entertaining certain cognitive states is sufficient for cognitive penetration to occur, but Macpherson actually rejects this idea:

> Of course, it may not be that all imaginative states can combine with perceptual ones to change the perceptual character of the resulting state. I do not suppose that occurs, in part, because I can't change my perceptual experiences at will by imagining…. Very specific conditions for interactions between perceptual and imaginary processes may exist. For example, the difference between voluntary and involuntary processes may have some, as yet unknown, role to play, as may one's familiarity with what one is imagining, as may some relations between imagined and perceived properties. These are matters for further philosophical reflection and no doubt in part

[18] In fact, I think that Macpherson is on a par with Deroy when it comes to the question whether a given outline shape is an effective/ineffective trigger of the relevant multimodal representation or cognitive states. If a cylindrical shape is not an effective trigger of the multimodal representation of cucumbers because the multimodal representations of zucchinis, cucumbers, and eggplants store very similar shape information, then it is also unclear how this shape could be an effective trigger of cognitive states about cucumbers—after all, cognitive states about zucchinis, cucumbers, and eggplants might as well include very similar shape information. On the other hand, if an outline shape of banana, due to its unique shape, is an effective trigger of the multimodal representation of bananas, then the outline shape is also likely to be an effective trigger of cognitive states about bananas. Given the latter point, I doubt that Macpherson or Deroy can explain the Banana case by simply maintaining that the outline shape of banana is less effective in triggering the multimodal representation of bananas or cognitive states about bananas than the untextured banana picture, than the textured banana picture. The explanation should lie somewhere else.

for psychologists to investigate. (Macpherson 2012, p. 58)

An argument Deroy proposes to reject Macpherson's mechanism is that bringing to mind cognitions about a banana while looking at a circle fails to cause the effects on color experiences to occur. However, a parallel case also seems to challenge Deroy's own mechanism: looking side by side at a textured banana picture and a circle in the same shade also fails to cause the effects on color experiences to occur—the banana picture does not look any yellower than the circle. To deal with this challenge, Deroy might as well admit that the occurrence of the effects on color experiences depends on further conditions in addition to the activation of relevant multimodal representations. She might argue that we are unable to identify what those conditions are since we still know too little about perceptual processing. But then, she cannot reject Macpherson's mechanism by simply pointing out that entertaining some cognitive states is insufficient for the effects on color experiences to occur because Macpherson also acknowledges that further conditions are needed.

So far, I have not said anything about how Macpherson's mechanism deals with the Banana case—how it explains the variation in the effects on color experiences of different versions of fruit pictures. Now I introduce a possible explanation by inviting you to consider these two cases: in the first case, you first look at a scratchy pencil sketch of a garden and then imagine seeing a garden; in the second case, you first look at a clear photograph of a garden and then imagine seeing a garden. Will your imaginative experiences be different in these two cases? I think that the answer is "Yes." You will very likely have a more vivid and detailed imaginative experience of seeing a garden in the second case than in the first. The reason, I suspect, is that which

picture you see can influence how you subsequently visualize a garden.

According to Macpherson's mechanism of cognitive penetration, cognitive states influence perceptual experiences by generating some imaginative experiences or processes. In light of the two garden cases above, Macpherson might explain the variation in the effects on color experiences as follows: seeing a more natural fruit picture—such as an untextured fruit picture or a textured fruit picture—helps trigger a more vivid imaginative experience of the fruit or an imaginative process that would normally produce such an experience, which then has greater influence on the participants' color experience of the picture. On the other hand, seeing a less natural fruit picture—such as an outline shape—is likely to trigger a less vivid imaginative experience of the fruit or an imaginative process that would normally produce such an experience, which in turn has weaker influence on the participants' color experience of the picture. This explanation is a plausible and coherent supplement to Macpherson's mechanism.

2.4 The Imagining Argument

In this section, I present an argument for the Downgrade Thesis based on Macpherson's mechanism, which I will call the "Imagining Argument." For the sake of discussion, I will be only concerned with imaginings that are caused by cognitive states through a semantically intelligible route. Here is the plan. First, I will argue that some imaginings lack evidential force. Then I will argue that because of the role that imaginings play, some cognitively penetrated perceptual experiences are epistemically downgraded.

To begin with, let's consider the following case: Sam expects that it will rain, so he imagines seeing rain when he looks out the window (the Rain-Imagining case). Apparently, Sam's imaginative experience does not give him justification for believing that it is raining. Why? One explanation is that in imagining the rain, Sam knows that the source of his experience is from within, so he has evidence that he is not seeing the rain. This evidence is a defeater of the justification provided by his imagining.[19] According to this explanation, Sam has prima facie justification from his imagining for believing that it is raining, but because he is aware that he is imagining, the prima facie justification fails to constitute all-things-considered justification. I do not find this explanation adequate because Sam seems to lack prima facie justification in the first place.

Another explanation appeals to the poor phenomenal character of Sam's imagining. For example, one might argue that it lacks the distinctive phenomenal character ordinary perceptual experiences have—phenomenal force, where the phenomenal force of an experience consists in that the experience represents its contents in such a way that it assures the subject of its contents' truth.[20] The underlying logic of this explanation seems to be that had Sam produced the imagining with phenomenal force, it would have the same evidential force as an ordinary visual experience of rain. For me at least, this is not the complete story. What goes wrong here not only seems to be that Sam's imagining has poor phenomenal quality, but also

[19] For general discussions of defeaters, see Bergmann (2006), Egan and Elga (2005), Kotzen (2013), Pollock (1987, 1995, and 2001), Pollock and Cruz (1999), and Pryor (2013). For a detailed discussion of defeaters of experiences, see Silins (2014).

[20] Dogmatism takes perceptual experiences to give us justification for beliefs about the external world in virtue of having phenomenal force. For defenses of this view, see Bengson (2015), Chudnoff (2011, 2012, 2013, and forthcoming), Huemer (2001, 2006, and 2007), Pryor (2000 and 2004), and Tucker (2010 and 2014 b).

something else, namely it is Sam's expectation that causes him to imagine seeing rain, so he does not have justification from the imagining for believing that it is raining.

I now propose an alternative explanation of the Rain-Imagining case, which at least partly attributes the lack of evidential force of Sam's imagining to its inappropriate etiology. We think that ordinary perceptual experiences give us justification for beliefs about the external world at least partly because these experiences are what are "given" to us. Although these experiences are often influenced by subpersonal-level states, such as the information stored within our perceptual system, they are substantially different from experiences that are directly caused by our personal-level states through a semantically intelligible route: the latter are what we fabricate for ourselves, whereas the former are not.[21] Sam's rain imagining, however, is directly caused by his expectation through a semantically intelligible route, and hence is what he fabricates for himself. No matter what the phenomenal character of the imagining is like, it is not legitimate evidence for him that it is raining, just as the evidence that we fabricate for ourselves in other occasions (e.g. one who wants to get a job forges an offer letter for himself) is not legitimate evidence for us that the relevant contents are true. [22][23]

[21] The phrase "through a semantically intelligible route" is necessary. One might think that imaginings whose contents bear no intelligible relationship to the contents of their causing cognitive states are more akin to what are given to us (I thank Matthew McGrath for pressing this point). Consider that your expectation to see apples causes you to imagine seeing a cat, or that your expectation that it will rain causes you to imagine seeing tiny people walking on the carpet. One might think that as such imaginings get more and more spontaneous, it becomes more and more vague whether we can attribute the relevant cognitive influences to you rather than to some subpersonal system. If such imaginings count as experiences that are given to you rather than experiences that you fabricate for yourself, then maybe they can give you justification for beliefs about the external world.

[22] In discussing the epistemology of cognitive penetration, McGrath (2013 and 2014) distinguishes between experiences that are "handed" to us and experiences that we "make." He models the epistemic evaluation of the latter experiences on the epistemic evaluation of inferences. Although McGrath barely

Once we clarify that it is the inappropriate etiology that prevents Sam's imagining from giving him justification, it is not difficult to argue that whether the imagining is deliberate or spontaneous makes little difference to its evidential force. Even if Sam's imagining arises spontaneously and he is unaware of his expectation being the source, as long as the imagining is directly caused by his expectation through a semantically intelligible route, it is a fabricated experience, and is not legitimate evidence for Sam that it is raining. Moreover, the epistemic status of Sam's expectation makes little difference to the evidential force of his imagining. Even if Sam expects that it will rain on a good ground, his imagining still fails to give him justification for believing that it is raining.

Finally, our analysis of the epistemology of imagining shows that etiology is important to the evidential force of an experience—an experience needs an appropriate etiology in order to justify. This point also applies to perceptual experiences. If a perceptual experience is partly fabricated by its subject, then this experience is also epistemically downgraded with respect to believing the relevant contents. I think that some cognitively penetrated perceptual experiences are partly fabricated by their subjects. In particular, I think that if Macpherson's mechanism is correct—that is, if some cognitively penetrated perceptual experiences have direct content and phenomenal contributions from both imagining and perception, then they are partly fabricated by their subjects, and therefore are epistemically downgraded with respect to believing the relevant contents.

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discusses imaginings and I also prefer Macpherson's mechanism of cognitive penetration, I do share with McGrath the idea that experiences that we fabricate for ourselves do not justify.

[23] For a more full-fledged version of this argument, see my draft "Is Phenomenal Force Sufficient for Immediate Perceptual Justification?"

The next step of the Imagining Argument is to argue for this conclusion. I will focus on the Apple case. Recall that Macpherson's explanation of this case is: the participants' imagining contributed a red element, and their perception contributed an orange element, resulting in a red-orange experience. Was the content "The apple picture is red-orange" partly fabricated by the participants? I think that the answer is "Yes."

To see this point, compare the Apple case with a more sophisticated version of the Rain-Imagining case, in which Sam incorporates the scene of his environment—such as the setting of the street—into his experience as the backdrop for the rain. Although Sam's experience has direct content and phenomenal contributions from his perception, "It is raining on the street" is partly fabricated by Sam because it also has direct content and phenomenal contributions from Sam's cognitively driven imagining. In the Apple case, the participants' cognitively driven imagining directly contributed to the content "The apple picture is red-orange." By analogy, this content is also partly fabricated by the participants, and hence gives them less justification than an unpenetrated red-orange apple experience.

One might point out that in the more sophisticated rain case, Sam's imagining barely interacts with his perception, but according to Macpherson's explanation of the Apple case, the participants' experience resulted from an imagining-perception interaction. One might wonder whether such an interaction could make "The apple picture is red-orange" a content that was given to the participants rather than a content that was partly fabricated by them. This urges us to compare the Apple case with some other cases, in which the experiences result from imagining-perception interactions.

As I see it, the two cases from Segal's experiments, which we introduced to show that the second step of Macpherson's mechanism could independently occur, are good candidates:

> **Manhattan:** The participants were asked to imagine a city skyline, while unbeknownst to them, a faint red tomato was projected onto the screen where they fixated. Several participants reported that they had an image of Manhattan at sunset.
>
> **Tomato:** The participants were seated under a vinyl hood and asked to imagine a tomato. They reported the tomato as red when, unbeknownst to them, a faint red tomato was projected onto the surface of the hood, whereas they reported the tomato as "shaded or dirty" red, as "shiny," as a "homegrown" tomato when a faint beer was projected.

In the Manhattan case, "Manhattan is at sunset" seemed to result from an interaction between the participants' imagining and perception. So did the content "There is a dirty red tomato" in the Tomato case. Did the imagining-perception interactions make "Manhattan is at sunset" or "There is a dirty red tomato" a content that was given to the participants? I do not think so. This is because the participants' cognitively driven imaginings directly contributed to these contents, and the imagining-perception interactions did not eliminate this fact. Similarly, in the Apple case, although the participants' imagining interacted with their perception to produce "The apple shape is red-orange," the interaction did not eliminate the fact that the participants' cognitively driven imagining directly contributed to this content. So the content was also partly fabricated by the participants, and was epistemically downgraded.

So far, I have completed the Imagining Argument for the Downgrade Thesis. Before ending this section, let's consider the following question: if perceptual

experiences have general color contents like "It is orange" in addition to determinate color contents like "It is red-orange," then in the Apple case, was the participants' experience epistemically downgraded with respect to believing that the apple picture is orange? I answer this question by emphasizing that the Downgrade Thesis only applies to contents that are fabricated by their subjects. If in the Apple case, the participants' perception alone contributed to the content "The apple picture is orange," then this content was given to the participants rather than was partly fabricated by them, and the participants' experience was not epistemically downgraded with respect to believing this content.

2.5 Good Cases of Cognitive Penetration

So far we have focused on bad cases of cognitive penetration. However, one might point out that there seems to be good cases of cognitive penetration, in which the resulting perceptual experiences are not epistemically downgraded.

> **Pine Tree:** When a tree expert looks at a pine tree, his expertise makes him see it as a pine tree. This experience seems to gives the expert no less justification for believing that it is a pine tree than an unpenetrated perceptual experience.[24]
>
> **Snake:** Smith is hiking and fears that there are snakes nearby. The fear makes him more sensitive to snakes. When he looks at some grass, he detects a snake he would not detect without the fear. This experience seems to give Smith no less justification for believing that there is a snake in the grass than an unpenetrated perceptual experience.[25]

Can our approach explain these cases? At least on the face of it, we encounter a problem: if a content of a cognitively penetrated perceptual experience is directly

[24] See Siegel (2012) and (2013 a).
[25] See Lyons (2011).

caused by a cognitively driven imagining through a semantically intelligible route, then that content, according to the Imagining Argument, is at least partly fabricated by its subject and is epistemically downgraded. However, as I pointed out earlier, Macpherson's mechanism focuses on one kind of imagining-perception interactions—namely both experiences/processes directly contribute to the contents and phenomenal character of the resulting experience. There might be other kinds of imagining-perception interactions, which do not generate fabricated contents and which are consistent with Macpherson's mechanism. Moreover, there might be other mechanisms through which cognitive penetration takes place, and the Pine-Tree case and the Snake case might be explained by such a mechanism rather than Macpherson's.

Let me start with the latter point. As I mentioned earlier, there is evidence that object-based attention and feature-based attention can occur during perceptual processing, so cognitive effects on perceptual experiences through influencing these attentions can be genuine cases of cognitive penetration. It is entirely possible that the Pine-Tree case and the Snake case are cases like this. In the Pine-Tree case, the expert's expertise might make him attend to the distinctive features of the tree in front of him, and hence makes him recognize it as a pine tree. In the Snake case, Smith's fear might make him pay special attention to snakes (or their distinctive features), and hence makes him more sensitive to snakes in the grass.

The cognitively driven attentions in the Pine-Tree case and the Snake case do not make "It is a pine tree" or "There is a snake in the grass" fabricated contents by their subjects. Although the expert's cognitively driven attention influences his perceptual experience, it does so through making some features more salient to him.

Just as cognitively driven spatial attention ordinarily makes some location more salient to their subjects without generating any fabricated contents, the expert's feature-based attention also does not make his experience fabricated. The experience can give him no less justification for believing that the tree is a pine tree than an unpenetrated perceptual experience.[26] Similarly, Smith's object-based attention (or feature-based attention) just makes the snake in the grass (or its distinctive features) pop out. The experience is still given to Smith, and can give him no less justification for believing that there is a snake in the grass than an unpenetrated perceptual experience.

Before I turn to discussing how Macpherson's mechanism might explain good cases of cognitive penetration, it is worth pointing out that I do not claim that attention-based perceptual experiences are always given to us. Consider the following version of the Apple case: when the participants looked at the apple picture, their cognitive states about the typical color of apples made them attend to the red component within the orange while ignoring the yellow component. As a result, they saw the picture as closer to red than its actual color. Siegel (2013 c) argues that such selection effects of attention can make the resulting perceptual experiences epistemically downgraded. If so, then an explanation might be: the participants' attention influenced their experience in such a way that "The apple picture is red-orange" becomes a fabricated content. Our analysis of the Pine-Tree case and the Snake case above does not rule out this possibility.

[26] Although I think that having an appropriate etiology is a necessary condition for perceptual justification, I am not committed to any positive view of what constitutes a sufficient condition for perceptual justification in this paper. I use the expression "can give him no less justification" rather than "give him no less justification" in this sentence because I want to leave it open whether other conditions are needed in order to for the perceptual experiences to justify.

Let's turn to the point that there might be other kinds of imagining-perception interactions, which do not generate fabricated contents and which allows Macpherson's mechanism to explain some good cases of cognitive penetration. The findings of Perky and Segal led to a substantial body of research on imagining-perception interactions, some of which suggested that there are many commonalities between the representation mediums that are activated in imagining and those that are activated in perception (see Kosslyn 1980 and Finke 1980).[27] Such commonalities not only leave open the possibility that imagining can interfere with perception, as demonstrated by the Perky effect, but also leave open the possibility that imagining can facilitate perception. For example, M. J. Farah (1985 and 1989) asked her participants to detect the presence of a faint letter H or T in a square while the participants projected a mental image of H or T onto the same location. It turned out that their detection was more accurate when they were imagining the same letter than a different one.

Moreover, J. Pearson et al (2008) demonstrated the imagining-perception facilitations by making use of binocular rivalry, the phenomenon that when dissimilar pictures are presented to one's two eyes at the same time, one is only aware of one picture at a time. In their experiment, Pearson et al presented the participants' left eyes with a green vertical grating and the right eyes with a red horizontal grating. They presented the pictures once about every 10 seconds, and the participants reported which of the pictures was dominant after each presentation. Under passive viewing, the participants tended to see the picture that was dominant in the previous trial. In the

[27] See Waller et al (2012) for a detailed literature review on the empirical research on imagining-perception interaction in the 20th century.

compared trials, Pearson et al. asked the participants to imagine one of pictures during the blank intervening period between presentations—either the dominant picture or the suppressed picture in the previous trial. The imagining of a given picture made the participants more disposed to see the same picture in the subsequent trial than under passive viewing, no matter whether the imagined picture was previously dominant or suppressed.[28]

The findings on the imagining-perception facilitations shed light on how Macpherson's mechanism might be expanded to explain some good cases of cognitive penetration. In some cognitive penetration, cognitive states trigger an imagining that does not directly contribute to the contents or phenomenal character of the resulting perceptual experience, but rather facilitates the perception of things in the external world. Because the role that imagining plays in such cognitive penetration is to make one more ready to perceive things, the cognitive penetration does not generate fabricated contents and does not make the resulting perceptual experiences epistemically downgraded. I think that the Snake case could be a case like this: because Smith fears that there are some snakes nearby, he starts to imagine a snake or a scene that contains a snake as he hikes. This imagining makes him more ready to spot a snake in his environment.

Admittedly, the imagining-perception facilitations might not be able to explain all good cases of cognitive penetration. For example, the Pine-Tree case seems to be better explained by featured-based attention. Moreover, although a few experiments demonstrated the facilitatory effects of imagining on perception, much more empirical

[28] For further experiments on the facilitatory effects of imagining on perception, see Ishai and Sagi (1995 and 1997), Michelon and Koenig (2002), and Michelon and Zacks (2003).

work needs to be done to reveal their nature. For example, how are these effects related to or different from the facilitatory effects of attention on perception? (Farah 1989 found that the facilitatory effects of imagining the letter H or T were qualitatively similar to the facilitatory effects of attending to H or T in a combination H-T stimulus; Pearson et al 2008, on the other hand, found no such similarity in the context of binocular rivalry.) Despite the limitation of the findings, our above analysis at least shows that Macpherson's mechanism has room for some good cases of cognitive penetration.

Conclusion

The Downgrade Thesis claims that for some cognitively penetrated perceptual experiences, if they are cognitively penetrated to represent that P, then they are epistemically downgraded with respect to believing that P. In this paper, I argued for the Downgrade Thesis by developing Macpherson's mechanism of cognitive penetration: in cognitive penetration, some cognitive states trigger an imagining, which interacts with perception and contributes to the contents and phenomenal character of the resulting experiences. I argued that ordinary cognitively driven imaginings do not give us justification because they are experiences that we fabricate for ourselves. Applying this point to cognitive penetration, I argued that some cognitively penetrated perceptual experiences are also partly fabricated by their subjects, and hence are epistemically downgraded with respect to believing the fabricated contents. So the Downgrade Thesis is true. Finally, I pointed out that Macpherson's mechanism allows other kinds of imagining-perception interactions,

such as imagining-perception facilitations. I argued that such facilitations do not necessarily generate fabricated contents, and our approach can appeal to it to explain at least some good cases of cognitive penetration.

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CHAPTER 3

COGNITIVE PENETRATION, INFERENTIALISM, AND BAYESIAN PERCEPTION

Introduction

It is uncontroversial that beliefs can result from inferences. If I believe that Shanghai is the largest city by population in China, and I further believe that the largest Chinese city is also the largest city in the world, then I can infer and come to believe that Shanghai is the largest city in the world. Moreover, it is uncontroversial that the justificatory status of beliefs and their power to justify beliefs can be influenced by the quality of inferences leading to them. In our example, if I believe that the largest Chinese city is also the largest city worldwide out of wishful thinking, then my inferred belief that Shanghai is the largest city in the world can be unjustified and can lack power to justify beliefs inferred from it.

Perceptual experiences, on the other hand, were traditionally contrasted with beliefs. They could not result from inferences, and hence their power to justify beliefs could not be influenced by the quality of inferences leading to them.[61]

Recently, some philosophers, such as McGrath (2013 and 2014) and Siegel (2013 a, 2013 b, and forthcoming), have rejected the traditional view about perceptual experiences. Instead, they argue for the following two theses:

[61] Most philosophers deny that perceptual experiences can be justified or unjustified, but Siegel (forthcoming) argues that perceptual experiences can have justificatory status. In this paper, when I discuss the epistemology of perceptual experiences, I will focus on their power to justify beliefs and will leave open whether they can have justificatory status or not.

> **The Descriptive Thesis:** Perceptual experiences can result from inferences.
>
> **The Epistemic Thesis:** The justificatory power of perceptual experiences can be influenced by the quality of inferences leading to them, where "justificatory power" refers to the power of perceptual experiences to justify beliefs.

I will call the view consisting of both of these theses "inferentialism." The main arguments for inferentialism focus on its explanatory power. The relevant explanandum is the lately heatedly discussed epistemological implications of cognitive penetration: perceptual experiences seem to lack justificatory power in some cases of cognitive penetration, where "cognitive penetration" refers roughly to the psychological phenomena that our perceptual experiences can be causally influenced by our cognitive states. Inferentialists think that their view explains such cases well, which gives us reason to adopt the view.

One consequence of inferentialism is that perceptual experiences resulting from inferences fail to give us basic justification for beliefs about the external world, where basic justification is justification that does not rely on any of our justification for other mental states, such as beliefs. In principle, this need not cause a serious problem for inferentialism. First, inferentialism does not assume the truth of foundationalism, which requires there to be a foundation for the edifice of our justified beliefs. Even if inferentialists want to adopt foundationalism, they can insist that perceptual experiences not resulting from inferences still give us basic justification. Moreover, they can also argue that if a perceptual inference is good, then the resulting experience inherits justificatory power from some premise states, and these premise states are alternative sources of basic justification.

In this paper, I will challenge inferentialism from a currently blooming empirical project, which analyzes perceptual experiences in terms of Bayesian inferences—inferences following Bayes' Theorem. If Bayesian theories of perception are correct, then the Descriptive Thesis of inferentialism is true. My challenge to inferentialism does not target the Descriptive Thesis but rather the Epistemic Thesis. In particular, I will argue that the Epistemic Thesis threatens to be skeptical when applied to Bayesian perceptual inferences, so we had better reject it and hence inferentialism.

In sections 3.1 and 3.2, I will say more about cognitive penetration and inferentialism. In section 3.3, I will introduce the core idea of Bayesian theories of perception. In section 3.4, I will propose my skeptical argument against the Epistemic Thesis and inferentialism. In section 3.5, I will consider some objections to my argument. I will end the paper by briefly explaining my favored account of the epistemological implications of cognitive penetration and how this account interacts with Bayesian theories of perception.

3.1 Cognitive Penetration and Inferentialism

We tend to think that perceptual experiences tell us about what the external world is like without being influenced by our own mind. But recent psychological and philosophical research indicates that this might not be true. Our beliefs, expectations, emotions and other personal-level mental states might influence what we experience. For example, in an experiment conducted by Hansen and his colleagues in 2006, the participants seemed to see a picture of a banana as closer to yellow than its actual

color, grey. Interestingly, this seemed to be because of the influence of their background cognition that bananas are typically yellow. This kind of cognitive effects on perceptual experiences is now called "cognitive penetration."[62]

The research of cognitive penetration not only has important consequences for psychology and the philosophy of mind, but also has interesting epistemological implications. Consider these cases:

> **Angel:** Jill fears that Jack is angry with her. When she later meets Jack, this fear causes her to see his face as expressing anger, despite the fact that Jack does not have an angry face at all.
>
> **Preformationism:** Preformationists irrationally believed that sperm cells contain embryos. When they observed some sperm cells under a microscope, they saw embryos in the cells.

For the sake of discussion, I will stipulate that these are genuine cases of cognitive penetration, and will focus on their epistemological implications. The experiences in these cases seem to lack justificatory power: Jill's experience seems to not give her justification for believing that Jack is angry; the preformationists' experience seemed to not give them justification for believing that the observed sperm cells contained embryos.

Some clarifications need to be made here. First, one might doubt that the experiences in these cases lack justificatory power. I argue for these epistemological implications in a different place.[63] Here I will assume their truths for the sake of

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[62] For some defenses of cognitive penetrability, see Cecchi (2014), Churchland (1988), Hohwy (2013), Macpherson (2012), and Vetter and Newen (2014). For rejections, see Deroy (2013), Firestone and Scholl (2015), Fodor (1984 and 1988), Pylyshyn (1999), and Raftopoulos (2001). For further discussions on the issue, see the anthology *The Cognitive Penetrability of Perception: New Philosophical Perspectives*, edited by Zeimbekis and Raftopoulos (2015).

[63] See Teng (forthcoming). For other defenses, see Ghijsen (2016), Lyons (2011), McGrath (2013 and 2014), Siegel (2012, 2013 a, 2013 b, and forthcoming), Vahid (2014), and Vance (2014). For criticisms, see Fumerton (2013), Huemer (2013), and Tucker (2014 a).

examining the plausibility of inferentialism. Second, the epistemological implications of cognitive penetration cases like the Anger case and the Preformationism case are worth serious consideration because such cases seem to constitute counterexamples to an important view in the epistemology of perception named "dogmatism." According to dogmatism, if it perceptually seems to us that P, then we thereby have justification for believing that P.[64] In the Anger case and the Preformationism case, it does perceptually seem to the subjects that P, but they lack justification for believing that P. This conclusion contradicts dogmatism.

Third, the epistemological implications of cognitive penetration need explanation: why do some cognitively penetrated experiences lack justificatory power? Inferentialists think that their view provides a good answer to this question. Their basic idea is that in cases like the Anger case and the Preformationism case, perceptual experiences are conclusions of bad inferences, and just as beliefs resulting from bad inferences can be unjustified, perceptual experiences resulting from bad inferences can also lack justificatory power. But to spell out this idea, different inferentialists focus on different kinds of inferences.

McGrath (2013 and 2014) argues that cognitive penetration involves inferences from one experience to another experience. On such a proposal, in the Anger case, Jill's fear might make her infer from an experience that Jack's facial muscles group in a certain way (which does not express anger) to an experience that Jack has an angry face. In the Preformationism case, the preformationists' unjustified background belief

[64] Adherents of dogmatism include Bengson (2015), Chudnoff (2011, 2012, 2013, and forthcoming), Huemer (2001, 2006, and 2007), Lycan (2014), Pryor (2000 and 2004), Silins (2014), Skene (2013), and Tucker (2010 and 2014 b).

that sperm cells contained embryos might make them infer from an experience that the observed sperm cells had components of a certain shape, size, and color (which were not good indicators of embryos) to an experience that those sperm cells contained embryos.[65]

To evaluate the quality of a perceptual inference, McGrath proposes that we evaluate the quality of its isomorphic belief inference, where to get the latter, we replace the input and output experiences with beliefs with the same contents.[66] For example, in the Anger case, the isomorphic belief inference is that Jill infers, under the influence of her fear, from a belief that Jack's facial muscles group in a certain way (which does not express anger) to a belief that Jack has an angry face. McGrath suggests that the evaluation rubrics are: if the isomorphic belief inference is good, then the perceptual inference is also good and the resulting experience has justificatory power; if the isomorphic belief inference is bad, then the perceptual inference is also bad and the resulting experience lacks justificatory power. The isomorphic belief inference in the Anger case jumps to the conclusion because Jill's fear fails to bridge the gap between the premise and the conclusion. According to the evaluation rubrics, the perceptual inference is also bad, and Jill's experience lacks justificatory power.

Here McGrath does not treat Jill's fear as a premise of the isomorphic belief inference but rather as a mental state that facilitates the transition from the premise to the conclusion. Why? McGrath does not discuss this question explicitly, but on a popular notion of belief inferences, the subjects must take the premises of an inference

[65] McGrath calls such perceptual inferences "quasi-inferences," to distinguish them from belief inferences.
[66] McGrath acknowledges that he borrows the strategy of appealing to an analogy with beliefs from Siegel (2013 a and 2013 b).

to be true (see Boghossian 2014). In fearing that Jack is angry, Jill does not take it to be true that Jack is angry. Maybe that is why McGrath does not treat Jill's fear as a premise.

However, there could also be cognitive penetration cases where the penetrating states are beliefs. Since beliefs are assertive and their subjects take them to be true, maybe McGrath should treat penetrating beliefs as premises of the relevant isomorphic belief inferences. For example, in the Preformationism case, the preformationists' experience was influenced by their unjustified background belief that sperm cells contained embryos. Maybe the isomorphic belief inference here should be that the preformationists inferred from a belief that the observed sperm cells had components of a certain shape, size, and color (which were not good indicators of embryos) and an unjustified background belief that sperm cells contained embryos to a belief that the observed sperm cells contained embryos.[67]

McGrath argues that the isomorphic belief inference in the Preformationism case was bad in a similar way that the isomorphic belief inference in the Anger case is bad—both inferences jump to conclusions. In particular, he points out that the preformationists' unjustified background belief fails to bridge the gap between the belief that the observed sperm cells had components of a certain shape, size, and color (which were not good indicators of embryos) and the belief that the sperm cells contained embryos. According to McGrath's evaluation rubrics, the perceptual inference in the Preformationism case was also bad, and the preformationists'

[67] McGrath, again, is vague on this, but Siegel (forthcoming) seems to hold such a view. When discussing the Anger case and the Preformationism case, she treats the preformationists' unjustified background belief as a premise, but does not treat Jill's fear as a premise.

experience lacked justificatory power. However, if, as discussed above, McGrath should treat the preformationists' unjustified background belief as a premise of the isomorphic belief inference, then the inference was bad for a second reason, namely one of its premises was unjustified. Siegel (forthcoming) emphasizes this point in her analysis of the Preformationism case, which I will discuss in a minute.

One objection to McGrath's view is that his proposed perceptual inferences seem to focus on transitions from experiences representing low-level properties, such as color, shape, volume, to experiences representing high-level properties, such as being angry and being an embryo. But there could also be cognitive penetration to experiences of low-level properties. Consider a toy example based on the experiment conducted by Hansen and his colleagues:

> **Color:** A banana-shaped object was grey, but the participants' background belief that banana-shaped objects are typically yellow made them see the object as yellow. The participants' experience seemed to not give them justification for believing that the object was yellow.

McGrath's reply is that in this case, the participants' background belief might cause them to infer from an experience that the object was grey to an experience that the object was yellow. If there was no intermediate step in this inference, then the inference jumped to the conclusion since the background belief failed to bridge the gap between the two experiences. McGrath argues that this can explain why the participants' experience lacked justificatory power.[68]

I don't think that the Color case brings out the real problem of McGrath's view. Given McGrath's analysis of the Anger case and the Preformationism case, there is

[68] McGrath (2014) discusses this reply in fn. 19.

nothing inconsistent for him to argue that there can also be perceptual inferences from some experiences representing low-level properties to other experiences representing low-level properties. The real problem of McGrath's view, as I see it, concerns the psychological plausibility of postulating that perceptual inferences involve transitions between experiences. When seeing a person as being angry, we do not go through two successive experiences, of which the first experience represents the person's facial muscles grouping in a certain way, and the second experience represents the person's face being angry.

McGrath might reply that in his proposed perceptual inferences, the input experiences and output experiences can be sub-experiences of the same experiences and happen at the same time, but the experiences nonetheless bear some inference-like relation to each other.[69] However, this reply does not help much. If some cognitive penetration cases involve jumping to conclusions in experiences, then there should be corresponding inconsistencies in the phenomenal character of the subjects' experiences. But the participants of experiments on cognitive penetration reported no such phenomenal inconsistencies. For example, the participants from the Color case did not report that the object looked grey and yellow at the same time; they only reported that the object looked yellow. This shows that postulating that perceptual inferences involve transitions between experiences is not psychologically plausible. Inferentialists, if wanting to hold on to their view, should focus on a different kind of perceptual inferences.

[69] McGrath (2014) discusses this reply in fn. 20.

3.2 Subpersonal Perceptual Inferences

Given the foregoing discussion, it is natural for inferentialists to think that the premises of perceptual inferences include mental states that happen before the generation of experiences and bear some casual relations to the latter. Siegel (forthcoming) proposes that subpersonal representations in the perceptual processing can be premises of perceptual inferences, although she seems to also think that McGrath's proposal can be correct.

Let's focus on the view that perceptual experiences can be inferred from subpersonal representations. According to this view, Jill's experience might be inferred from a subpersonal representation that Jack's facial muscles group in a certain way (which does not express anger) under the influence of her fear. To evaluate the quality of this perceptual inference, Siegel also adopts the approach of comparing it with its isomorphic belief inference, where to get the latter we replace both the subpersonal representation and the experience with beliefs with the same contents. The isomorphic belief inference of Jill's perceptual inference here is the same as what McGrath suggests—namely Jill infers, under the influence of her fear, from a belief that Jack's facial muscles group in a certain way (which does not express anger) to a belief that Jack has an angry face. Since this is a bad belief inference, Jill's perceptual inference is also bad, and her experience lacks justificatory power.

Siegel's discussion of the Preformationism case focuses on the aspect that the penetrating background belief was unjustified. She argues that the preformationists' experience might result from an inference from a subpersonal representation that there were some sperm cells and the preformationists' unjustified background belief that

sperm cells contained embryos. Since the unjustified background belief made the isomorphic belief inference bad, the preformationists' perceptual inference was also bad, and their experience lacked justificatory power.

Now there are many subpersonal representations in the perceptual processing. One might wonder what rationalizes Siegel to take a particular subpersonal representation to be the premise of a perceptual inference? For example, McGrath proposes that the preformationists' experience was inferred from an experience that the observed sperm cells contained components of a certain shape, size, and color (which were not good indicators of embryos). Why doesn't Siegel take the input subpersonal representation of the preformationists' perceptual inference to be one with the same content? Why does she instead choose the subpersonal representation with the content that there were some sperm cells?[70]

Siegel does not discuss this question explicitly. But to avoid arbitrariness, she might reply that which subpersonal representation is the input depends on the particular case. Given that the details of the Preformationism case are not spelled out, there are different ways to construct the relevant perceptual inference. Siegel might grant that the preformationists' experience could be inferred from a subpersonal representation with a different content than what she suggests. But no matter which subpersonal representation one chooses, as long as the penetrating background belief was unjustified, the perceptual inference was bad. This alone is enough to explain the lack of justificatory power of the preformationists' experience. Moreover, Siegel might say something similar about the Anger case: no matter which subpersonal

[70] We can ask similar questions to McGrath's view.

representation is the input, Jill's fear fails to bridge the gap between the former and her experience.

Although this reply works well with the Anger case and the Preformationism case, it does not work so well with the Color case because in the latter, which subpersonal representation to choose could matter to the quality of the perceptual inference. If the participants' experience that the banana-shaped object was yellow was inferred from a subpersonal representation that it was grey and their background belief that banana-shaped objects are typically yellow, then it was a bad inference. But if the experience was instead inferred from a subpersonal representation that the object was banana-shaped and the participants' background belief, then it could be a good inference. The background belief could bridge the gap between the subpersonal representation and experience. Moreover, the background belief could be justified given the participants' past experiences. If so, how does Siegel explain the epistemological implication of the Color case non-arbitrarily?

As I see it, there are two ways for Siegel to explain the Color case. First, she might argue that our conclusion about the epistemological implication of the Color case is not accurate. She might insist that just like the Anger case and the Preformationism case, the justificatory power of the participants' experience in the Color case depends on the quality of the perceptual inference leading to the experience. If the experience was inferred from a subpersonal representation that the object was grey and the background belief, then the experience lacked justificatory power. If the experience was inferred from a subpersonal representation that the object was banana-shaped and the background belief, then the experience could have

justificatory power. Siegel might add that as long as we spell out the details of the case, such as "Where in the participants' perceptual processing did cognitive penetration take place?" we know which perceptual inference to focus on. Therefore, there is nothing arbitrary in inferentialists' explanation.

On the other hand, Siegel might challenge the psychological plausibility of there being a perceptual inference that is from a subpersonal representation that an object is banana-shaped and a background belief that banana-shaped objects are typically yellow to an experience that the object is yellow. The basic idea here is that the perceptual system might unfold color information before unfolding information like being banana-shaped. If the background belief penetrates after the unfolding of the latter information, then the color information is already there and should be taken as a premise of the perceptual inference. According to this reply, when we think that in the Color case the perceptual inference could be from a subpersonal representation that the object was banana-shaped, we should include another premise, namely the subpersonal representation that the object was grey. But then, the perceptual inference still jumped to the conclusion, and inferentialists face no problem in explaining why the experience lacked justificatory power.[71]

So far, I have introduced Siegel's inferentialism and how it explains the epistemological implications of various cognitive penetration cases.[72] To summarize,

[71] Siegel never discusses this reply, but I think that it is worth consideration. Of course, whether this reply works depends on whether the perceptual system indeed unfolds color information before unfolding information like being banana-shaped.

[72] I have mostly focused on bad cognitive penetration cases, in which experiences seem to lack justificatory power due to cognitive penetration. One might argue that there can also be good cognitive penetration cases. For example, when a tree expert looks at a pine tree, his expertise makes him see it as a pine tree. This experience seems to gives the expert justification for believing that it is a pine tree. Siegel's explanation of good cognitive penetration cases is parallel to her explanation of bad cognitive

this view embraces the following two theses:

> **The Descriptive Thesis:** Perceptual experiences can result from inferences, where the premises can include subpersonal representations in the perceptual processing.
>
> **The Epistemic Thesis:** The justificatory power of perceptual experiences can be influenced by the quality of inferences leading to them. More specifically, we evaluate the quality of perceptual inferences by evaluating their isomorphic belief inferences, where we replace both the subpersonal representations and experiences with beliefs with the same contents to get their isomorphic belief inferences. If the isomorphic belief inferences are good, then the perceptual inferences are good, and vice versa.

In the rest of this paper, I will focus on this version of inferentialism and will argue that it faces a skeptical challenge if currently flourishing Bayesian theories of perception are correct.

3.3 Bayesian Theories of Perception

To understand Bayesian theories of perception, we need to first understand constructivist approaches of perception, which date back to Helmholtz (1867) and propose that the perceptual system determines what experiences to generate by conducting unconscious inferences from the sensory data and prior assumptions about the environment.

Constructivist approaches of perception emphasize that the perceptual system faces an underdetermination problem: the sensory data received by the perceptual

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penetration cases: whereas the latter involve bad perceptual inferences, the former involve good perceptual inferences. In the Pine-Tree case, she argues, the tree expert's experience might be inferred from a subpersonal representation that the tree he looks at has certain properties and his knowledge that trees having these properties are pine trees. Because this is a good perceptual inference, the expert's experience has justificatory power. The fact that inferentialism provides a good explanation of cases like the Pine-Tree case, Siegel argues, further supports the view.

system are insufficient to determine their external causes, yet the perceptual system has to figure out what experiences to generate based on the sensory data. For example, the sensory data received when viewing a convex object under normal lighting are consistent with at least two possibilities: (i) the object is convex and illuminated from above, or (ii) it is concave and illuminated from below. According to constructivism, although the sensory data are ambiguous, with a prior assumption that lighting normally comes from above, the perceptual system infers and produces an experience that the object is convex and illuminated from above.

Bayesian theories of perception fall under the constructivist tradition, and have been very successful among all constructivist approaches.[73] According to Bayesian theories, the perceptual system conducts unconscious inferences to produce experiences by following Bayes' Theorem:

$$Pr(H/D) = Pr(D/H) * Pr(H) / Pr(D)$$

Bayes' Theorem tells us how to calculate the probability of a hypothesis H upon receiving some data D. Pr(H/D) is the probability of H upon receiving D, Pr(D/H) is the probability of receiving D given H, Pr(H) is the probability of H prior to receiving D, and Pr(D) is the probability of D. For the sake of discussion, I want to introduce some jargons: Pr(H/D) is also called the *posterior probability* of H, Pr(D/H) is also called the *likelihood* of D given H, and Pr(H) is also called the *prior probability* of H. Since Pr(D) is just a normalizing constant, Bayes' theorem states that the posterior

[73] For some recent empirical evidence for Bayesian theories of perception, see Kersten, Mamassian, and Yuille (2004), Weiss, Simoncelli, and Adelson (2002), and Yuille and Kersten (2006). For earlier relevant research, see the anthology *Perception as Bayesian Inference*, edited by Knill and Richards (1996/2008). For recent overviews of Bayesian theories of perception, see Bennett, Trommershauser, and Van Dam (2014), Feldman (forthcoming), and Rescorla (2015).

probability of H is proportional to its prior probability, multiplied by the likelihood of D given H.

According to Bayesian theories of perception, when the perceptual system receives some new sensory data D, it conducts a two-step inference to determine what experiences to generate. In the first step, for all relevant hypotheses H_1, H_2, H_3, H_4 … about the external cause of D, the perceptual system calculates the posterior probabilities of the hypotheses—$Pr(H_i/D)$—based on Bayes' Theorem.

However, perceptual experiences seem to have non-probabilistic contents. For example, we seem to experience objects as having certain colors, shapes, and sizes rather than having a spectrum of these properties. So in the second step, the perceptual system selects one hypothesis out of all the relevant hypotheses to produce a non-probabilistic experience, an experience with non-probabilistic contents. The selection is based on the posterior probabilities of the hypotheses, and usually follows a decision rule, such as "Select the hypothesis that has the highest posterior probability."

To illustrate how Bayesian perceptual inferences work, let's consider the Concave/Convex case again. Suppose that there are only two relevant hypotheses in this case:

> Convex & Above = The object is convex and illuminated from above
>
> Concave & Below = The object is concave and illuminated from below

Suppose that the prior probabilities and likelihoods are:

> Pr(D/Convex & Above) = 1 Pr(D/Concave & Below) = 1
>
> Pr(Convex) = 0.5 Pr(Concave) = 0.5

Pr(Above) = 0.9 Pr(Below) = 0.1

According to Bayesian theories of perception, to determine which experience to generate, the perceptual system first calculates the posterior probability of Convex & Above and that of Concave & Below by following Bayes' Theorem ("$\propto$" means being proportional to):

Pr(Convex & Above/D) $\propto$ Pr(D/Convex & Above) * Pr(Convex & Above)

Pr(Concave & Below/D) $\propto$ Pr(D/Concave & Below) * Pr(Concave & Below)

Given that Pr(D/Convex & Above) is equal to Pr(D/Concave & Below), which of Pr(Convex & Above/D) and Pr(Concave & Below/D) is higher depends on which of Pr(Convex & Above) and Pr(Concave & Below) is higher:

Pr(Convex & Above) = Pr(Convex) * Pr(Above) = 0.5 * 0.9 = 0.45

Pr(Concave & Below) = Pr(Concave) * Pr(Below) = 0.5 * 0.1 = 0.05

Pr(Convex) is equal to Pr(Concave), but Pr(Above) is much higher than Pr (Below). Therefore, Pr(Convex & Above) is much higher than Pr(Concave & Below), and Convex & Above has the highest posterior probability.

Second, following the decision rule "Select the hypothesis that has the highest posterior probability," the perceptual system selects Convex & Above to generate a non-probabilistic experience that the object is convex and illuminated from above.

Bayesian theories of perception have room for cognitive penetration. For example, Clark (2013 and 2016) and Hohwy (2013) argue that beliefs and knowledge can influence the value of prior probabilities and likelihoods, which are used in the

calculation of posterior probabilities of relevant hypotheses. In a Bayesian version of the Anger case, Jill's fear can make the perceptual inference start with a high prior probability with respect to the hypothesis that Jack is angry, and hence can make Jill end up experiencing Jack's face as being angry. According to inferentialism, this perceptual inference is bad since the prior probabilities it starts with are unjustified. So Jill's experience lacks justificatory power. Something similar can be said about a Bayesian version of the Preformationism case in which the preformationists' unjustified background belief made the perceptual inference start with a high prior probability with respect to the hypothesis that the observed sperm cells contained embryos.

In a Bayesian version of the Color case, the penetrating state could be a justified background belief that banana-shaped objects are typically yellow. If the belief influenced the prior probabilities, then inferentialists might have to take the influence as epistemically innocent. However, depending on how firmly one believes that this is still a bad cognitive penetration case, one might argue that this case constitutes a counterexample to inferentialism—especially to the Epistemic Thesis. My argument against inferentialism targets the Epistemic Thesis, but is from a different perspective. If Bayesian theories of perception are correct, then experiences can result from perceptual inferences that have subpersonal representations as their premises. So Bayesian theories imply that the Descriptive Thesis of inferentialism is true. I will argue that the Epistemic Thesis threatens to be skeptical when applied to Bayesian perceptual inferences, so we had better reject it.

Before presenting my argument, I want to make one more point about Bayesian

theories of perception and cognitive penetration. Both Clark and Hohwy discuss the possibility of cognitive penetration to the calculation of prior probabilities and likelihoods. But this is not the only place in a Bayesian perceptual processing where cognitive penetration might occur. It is possible that assumptions stored within the perceptual system influence the calculation of prior probabilities and likelihoods, but after the perceptual system calculates posterior probabilities and selects the hypothesis that has the highest posterior probability, cognitive states can nonetheless influence the generation of the perceptual experience. I will come back to this point when discussing my alternative account of the epistemological implications of cognitive penetration and how this account interacts with Bayesian theories of perception.

3.4 A Problem for Inferentialism

According to Bayesian theories, the second step of a Bayesian perceptual inference selects the hypothesis H with the highest posterior probability *n* to yield a non-probabilistic experience. This inference seems to be from a subpersonal representation that H is with posterior probability *n* to an experience that H:

> Subpersonal representation that H is with posterior probability n → Experience that H

According to the Epistemic Thesis, to evaluate this perceptual inference, we evaluate its isomorphic belief inference. However, what is tricky about this perceptual inference is that its premise involves probability. As I see it, there are two ways to construct the isomorphic belief inference, depending on whether we replace the subpersonal representation with a binary belief or a graded belief. In particular, the

first way is to replace the subpersonal representation with a binary belief that the probability of H is *n* and replace the experience with a binary belief that H; the second way is to replace the subpersonal representation with an *n*-degree of belief that H and replace the experience with a binary belief that H.

Let's consider these possibilities in order. Suppose that the isomorphic belief inference is from a binary belief that the probability of H is *n* to a binary belief that H:

Binary belief that the probability of H is *n* → Binary belief that H

In order for this belief inference to be good, the degree *n* in the premise needs to be sufficiently high; otherwise this inference jumps to the conclusion. To see this point, consider the following example, which involves an inference like this. In a murder, the police track down five suspects. Given the evidence the police have collected, suspect A most likely committed the murder, but the probability is only 0.3. In this case, it is clearly bad for the police to infer and believe that A committed the murder.[74]

Similarly, the fact that the hypothesis H has the highest posterior probability *n* relative to other hypotheses does not imply that *n* is high. If Bayesian theories are correct, then it is possible that in many Bayesian perceptual inferences the highest posterior probability *n* is pretty low due to the relevant prior probabilities and likelihoods. In these cases, the isomorphic belief inferences of the Bayesian perceptual inferences are bad. According to the Epistemic Thesis, the Bayesian perceptual inferences are also bad, and the experiences lack justificatory power. The Epistemic Thesis can lead to a quite skeptical conclusion about perceptual justification, depending on how widespread bad Bayesian perceptual inferences are. So unless

[74] I thank Nico Silins for suggesting this example to me.

inferentialists can show that the highest probability *n* is sufficiently high in most Bayesian perceptual inferences, inferentialism seems to face a serious challenge.

What about the second way of constructing the isomorphic belief inference? Does it help inferentialism avoid the skeptical challenge? Suppose that the isomorphic belief inference of the second step of a Bayesian perceptual inference is from an *n*-degree of belief that H to a binary belief that H:

n-degree of belief that H → Binary belief that H

Is this a good belief inference? The answer depends on whether a binary belief can be justifiably inferred from a graded belief.[75] Some philosophers, such as Foley (1993 and 2009), argue that a binary belief is just a sufficiently high degree of belief. They further clarify that the threshold for being a sufficiently high degree of belief cannot be too high, such as subjective certainty, or too low, such as below 0.5. For in ordinary circumstances, there seems to be a close relation between unqualified assertions and the speakers' binary beliefs—it is natural to take the former to reflect the latter. However, we often lack subjective certainty in unqualified assertions we make. This is particularly clear in the fact that we won't be willing to bet our lives on things we unqualifiedly assert. Therefore, binary beliefs cannot be graded beliefs with probability 1.

On the other hand, these philosophers argue, if the threshold for being a sufficiently high degree of belief were too low, then we would end up believing almost everything. Because the consequent is obviously false, the antecedent should also be false. Moreover, Foley (1993 and 2009) argue that we should have more confidence in

[75] For some discussions on the relationship between these two conceptions of belief, see Buchak (2013), Christensen (2004), Foley (1993 and 2009), Frankish (2009), Kaplan (1996), and Maher (1993).

propositions we believe than the negations of these propositions, so the threshold for being a sufficiently high degree of belief should be no less than 0.5.

According to this view about the relationship between binary beliefs and graded beliefs, if one has a sufficiently high degree of belief, then one can justifiably infer a binary belief from the former. However, as before, the fact that the hypothesis H has the highest posterior probability n among all relevant hypotheses does not guarantee that *n* is high in number. If Bayesian theories of perception are correct, then it is entirely possible that in many Bayesian perceptual inferences, the highest posterior probability *n* is pretty low. In these cases, the Epistemic Thesis predicts that the isomorphic belief inferences "*n* degree of belief that H → Binary belief that H" are bad, and so are the second step of the Bayesian perceptual inferences. Therefore, unless inferentialists can show that *n* is sufficiently high in most Bayesian perceptual inferences, inferentialism still faces the skeptical challenge—namely our perceptual experiences seem to lack justificatory power in a lot of cases.

There are also philosophers who doubt that a binary belief can be justifiably inferred from a graded belief. For example, Kaplan (1996) and Maher (1993) use the lottery case to argue that even an extremely high degree of belief is not enough for a binary belief. In the lottery case, a fair lottery has a hundred tickets and exactly one winning ticket. If you purchase a ticket, then it is rational for you to have 0.99-degree of confidence that it will lose. Assume for reductio that it is also rational for you to hold a binary belief that your ticket will lose. This assumption implies that it is rational for you to hold a binary belief that any other ticket from the lottery will lose for a similar reason. By deductive closure, it is rational for you to believe the

conjunction of all your binary beliefs—namely all the tickets of the lottery will lose. This contradicts the initial set-up of the lottery case. Kaplan and Maher suggest that we reject that a binary belief can be justifiably inferred from a graded belief.

What is the implication of Kaplan and Maher's view for inferentialism? If a binary belief cannot be justifiably inferred from a graded belief, then inferentialism seems to face an even worse situation. For according to Kaplan and Maher's view, all isomorphic belief inferences "n degree of belief that H → Binary belief that H" are bad. The Epistemic Thesis has to predict that all Bayesian perceptual inferences are bad, and all our experiences lack justificatory power. This is a radical skeptical conclusion.

To sum up, no matter how we construct the isomorphic belief inference of the second step of a Bayesian perceptual inference, the Epistemic Thesis seems to lead to a skeptical conclusion about perceptual justification. This gives us good reason to reject the Epistemic Thesis and hence inferentialism.

3.5 Objections and Replies

In this section, I will consider some objections to my argument against Bayesian theories of perception. First of all, one might point out that my argument assumes that Bayesian theories of perception are correct, but inferentialists might defend their view by rejecting the former. For example, one might doubt that the perceptual system conducts unconscious inferences by strictly following Bayes' Theorem, and might wonder whether this could relieve inferentialism from the skeptical worry.

In reply, I emphasize that the problematic step of a Bayesian perceptual

inference is where the perceptual system generates a non-probabilistic experience based on the hypothesis that has the highest posterior probability. Even if the perceptual system does not follow Bayes' Theorem to calculate the posterior probability of the hypothesis, this does not weaken my point against inferentialism. As a matter of fact, my argument can get off the ground as long as the perceptual system decides what experiences to generate by assigning probabilities to relevant hypotheses—given the underdetermination problem faced by the perceptual system, this seems to be a natural way to go. Furthermore, if the perceptual system assigns probabilities to hypotheses randomly or with flaws, then the Epistemic Thesis implies that perceptual inferences suffer from other defects in addition to the defect I focus on. This actually strengthens my argument that the Epistemic Thesis and inferentialism threaten to be skeptical.

However, one might point out that there are alternative approaches to perception that reject constructivism in general (see Gibson 1950, 1966, and 1979), and my reply fails to consider this possibility. I answer two things here. First, since constructivism takes experiences to result from inferences, this approach might be more congenial to inferentialism than alternative approaches. Second, I remind the critic that inferentialists motivate their view by focusing on its explanatory power—they argue that their view explains the epistemological implications of various cognitive penetration cases nicely. However, as I mentioned earlier, constructivism and Bayesianism have been very successful empirically, and they seem to have great explanatory power with respect to understanding how perception works. If inferentialists are consistent in their argument strategy, they cannot just ignore

constructivism and Bayesianism without legitimate reasons.

The second objection to my argument against inferentialism appeals to a distinction between personal-level inferences and subpersonal-level inferences. One might point out that the quality of a belief inference influences the justificatory status of the resulting belief importantly because the belief inference is attributable to the subject. If a crazy scientist inferred unjustifiably from a belief that P to a belief that Q and instilled the latter belief into your mind, then we would not think that the quality of the scientist's inference affects the justificatory status of your belief that Q. Your belief that Q can still be justified or unjustified, but its justificatory status is due to something else than the quality of the scientist's inference. Similarly, one might argue, whether a belief inference is attributable to a person or a subpersonal system also makes a difference. Only the former can affect the justificatory status of a belief; the latter cannot.

One might argue that according to the Epistemic Thesis, we evaluate perceptual inferences in light of how we evaluate belief inferences. The above epistemic distinction between personal-level inferences and subpersonal-level inferences also applies to perceptual inferences. But since a Bayesian perceptual inference is conducted by the perceptual system, it is subpersonal. Even if the inference is bad, it does not influence the justificatory power of the resulting experience. This allows the Epistemic Thesis and inferentialism to avoid the sort of skeptical challenge I raised in my argument.[76]

[76] I thank McGrath for raising this objection to me. McGrath's version of inferentialism seems to focus on personal-level perceptual inferences rather than subpersonal-level perceptual inferences. He takes perceptual inferences to be from one experience to another experience, where the transition between

I think that this is good reply, but it is not available to inferentialism because it seems to backfire. Recall that when explaining the epistemic implications of cognitive penetration cases, inferentialists take perceptual inferences to include subpersonal representations as their premises. According to this version of inferentialism, in the Anger case, Jill's experience that Jack has an angry face might be inferred from a subpersonal representation that Jack's facial muscles group in a certain way (which does not express anger) under the influence of Jill's fear. In the Preformationism case, the preformationists' experience that the observed sperm cells contained embryos might be inferred from a subpersonal representation that there were some sperm cells and the preformationists' unjustified background belief that sperm cells contained embryos. But these perceptual inferences are not personal-level inferences.

First, the perceptual inference in the Anger case is subpersonal since the only premise of this inference is the subpersonal representation that Jack's facial muscles group in a certain way (which does not express anger). Although Jill's fear facilitates the inference from the subpersonal representation to the resulting experience, as I explained in section 3.1, inferentialists don't take it as a premise of the inference.

The Preformationism case is more complicated. The perceptual inference here has two premises, of which one premise is a subpersonal representation and the other is a personal-level background belief. Does the involvement of a personal-level premise make this a personal-level inference? I don't think so. For if one of the premises is a subpersonal representation, then that premise is not accessible to the

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them must be explained by personal-level mental states. He also emphasizes that subpersonal-level perceptual inferences should not influence the justificatory power of the resulting experiences. But as I argued in section 3.1, I don't think that his proposed perceptual inferences are psychologically plausible.

preformationists, and it makes no sense to claim that it was the preformationists who inferred from the subpersonal representation and their background belief to the resulting experience. However, if inferentialists focus on subpersonal inferences to support their view, then they cannot consistently appeal to the epistemic distinction between personal-level inferences and subpersonal-level inferences to reply to my argument.

Third, I stipulate "justificatory power" to be the power to justify binary beliefs rather than the power to justify graded beliefs. One might propose that inferentialists can focus on the latter and argue that Bayesian perceptual inferences, though bad in the way I suggest, can nonetheless give the resulting experiences power to justify graded beliefs. For example, if H has the highest posterior probability—say 0.6, and the perceptual system generates an experience that H, then, one might argue, the experience gives the subject justification for having a 0.6-degree of belief that H.

In reply, I first highlight the fact that we form binary beliefs based on our experiences all the time. As long as this is true, then inferentialists face the challenge that the Epistemic Thesis, when applied Bayesian perceptual inferences, leads to a skeptical conclusion about the power of our experiences to justify binary beliefs.

Moreover, even if inferentialists set binary beliefs aside and focus on graded beliefs, this does not ease them from worrying about the skeptical challenge. According to Bayesian theories of perception, the Bayesian calculation of posterior probabilities is subpersonal, and the resulting experiences are non-probabilistic, so we have no access to the posterior probabilities. In the case the critic has in mind, even if the experience justifies the subject to have a 0.6-degree of belief, the subject does not

know it, and hence the subject is not in a position to use the justification to form a 0.6-degree of belief. If the subject forms a graded belief arbitrarily—say he/she picks the degree 0.9—then the graded belief is unjustified.[77]

One might point out that my argument assumes that our experiences are non-probabilistic, but this assumption might be rejected. For example, Morrison (2016) argues that our experiences assign degrees of confidence. One case he discusses is that when we see someone walking to us from a far distance, our degree of belief that the person is Isaac can gradually increase. Morrison thinks that the increase in our degree of belief reflects an increase in our perceptual confidence—as the person walks closer, we have more perceptual confidence that it is Isaac, and hence have a higher degree of belief that it is Isaac. Morrison leaves it open whether perceptual confidence has anything to do with Bayesian perceptual inferences. However, one might argue that if perceptual confidence transmits posterior probabilities from Bayesian perceptual inferences to the conscious level, then we can form justified graded beliefs based on our experiences.

I am not sure how promising this view is. Even if our experiences assign confidence based on the posterior probabilities from Bayesian perceptual inferences, one question to ask is whether they assign precise degrees of confidence or imprecise

[77] Epistemologists usually distinguish between propositional justification and doxastic justification. Propositional justification is about having good reason for believing a proposition, and doxastic justification focuses on using the good reason properly to form and maintain a belief. Suppose that both you and I see that it is raining. Whereas you believe that it is raining based on your visual experience, I believe so out of wishful thinking. In this case, we both have propositional justification because we both have good reason from our visual experiences for our beliefs. But only you have doxastic justification because only you use the reason properly to form your belief.

Going back to the current discussion, even if the experience justifies the subject to have a 0.6-degree of belief, the subject only has propositional justification. Because the subject cannot know what degree of belief he/she should have, he/she is not in a position to form a doxastically justified graded belief. But then, the skeptical challenge is still there.

degrees of confidence. Morrison is vague about this question. Suppose that the posterior probabilities from Bayesian perceptual inferences assign precise probabilities, but our experiences assign imprecise degrees of confidence, such as minima (e.g. greater than 0.3), maxima (e.g. less than 0.8), or range of emphasis (e.g. 0.3 - 0.8). Then can experiences give us justification for having precise graded beliefs? For example, if the posterior probability of H is 0.5, but our experience assigns 0.3 - 0.8 degree of confidence to H, can the experience justify a 0.8-degree of belief that H?

Second, even if our experiences assign precise degrees of confidence, can we tell different degrees of confidence apart? If not, then we cannot know what degrees of belief we should have. If we form a graded belief arbitrarily, then it is unjustified. Since we lack clear answers to these questions at this point, it is hard to tell whether inferentialism can avoid the skeptical challenge by adopting perceptual confidence.

3.6 An Alternative Explanation of Cognitive Penetration

If the Epistemic Thesis and inferentialism are wrong, what is an alternative explanation of the epistemological implications of cases like the Anger case, the Preformationism case, and the Color case? Here I introduce one possible explanation, which builds on Macpherson (2012)'s psychological mechanism of how some cognitive penetration can take place.[78]

The psychological mechanism consists of two steps. In the first step, some cognitive states activate an imaginative process, and in the second step, the imaginative process interacts with the perceptual process to produce a perceptual

[78] For a full account of this alternative explanation, see Teng (forthcoming).

experience has contributions from both processes. For example, according to this psychological mechanism, what happened in the Color case might be that the participants' background belief that banana-shaped objects are typically yellow made them imagine that the banana-shaped object they looked at was yellow, and this interacted with their perception that the object was grey, producing an experience that the object was yellowish grey. There is independent evidence that imagining can interact with perception, which I won't discuss here.[79]

However, imaginings are poor grounds for forming beliefs. If I expect that it will rain and imagine seeing rain when I look out the window, then obviously, my imagining does not give me justification for believing that it is raining. This is at least partly because my imagining is an experience that I fabricate for myself. What I fabricate for myself cannot be legitimate evidence for me that the relevant contents are true. To see this point, compare my imagining with things that we fabricate for ourselves in other occasions. Suppose that I really want to get a job, so I forge an offer letter for myself. The offer letter does not give me justification for believing that I get the job because I fabricate the letter for myself. Analogously, my imagining that it is raining, being an experience that I fabricate for myself, also lacks justificatory power.

Applying this epistemology of imagining to the above mechanism of cognitive penetration, I argue that some cognitively penetrated experiences also have fabricated contents, and hence do not give their subjects justification for believing these contents. For example, in the Color case, the participants' imagining contributed a yellow element to their experience, so the content that the object was yellow should count as

[79] For some of such evidence, see Perky (1910) and Segal (1971, 1972).

fabricated by the participants, and their experience should lack power to justify beliefs about this content. Similar things can be said about the Anger case and the Preformationism case. In both cases, the penetrating states cause the subjects to imagine, which contribute some contents to their perceptual experiences. Since the subjects fabricate such contents, they lack justification to believe the contents from their experiences.

Earlier in the paper, I argued that inferentialism leads to a skeptical conclusion when applied to Bayesian Theories of perception. One might wonder how my view relates to Bayesian theories of perception—whether the latter excludes the former. As I see it, Bayesian theories of perception are meant to explain how perception works, but they leave open questions about whether and how perception interacts with imagining.

At the end of section 3, I pointed out that if Bayesian theories of perception are correct, then there might be more than one place at which cognitive penetration can happen. Clark and Hohwy focus on cognitive penetration to the calculation of prior probabilities and likelihoods. But it is also possible that after the calculation of posterior probabilities and the selection of a hypothesis, cognitive states can nonetheless influence the succeeding path to the generation of an experience. If so, then Macpherson's mechanism provides a psychologically plausible model of how such cognitive penetration takes places—namely it happens through imagining-perception interaction. Moreover, my view from the epistemology of imagining also provides a good explanation of the epistemological implications of such cognitive penetration.

Conclusion

In this paper, I argued against inferentialism by showing that the Epistemic Thesis, when combined with Bayesian theories of perception, is likely to lead to skepticism about perceptual justification. Admittedly, the argument was not decisive. In the future research, we would like to know more about the following questions: (1) Do Bayesian theories of perception characterize how perception works accurately? (2) Are perceptual experiences cognitively penetrable? If so, when and through what psychological mechanism does it take place? Does imagining play any important role? (3) Do experiences assign degrees of confidence to their contents? If so, do they assign degrees of confidence based on Bayesian perceptual inferences? Do they assign precise degrees or imprecise degrees? Can the subjects tell what degrees of confidence their experiences assign? (4) Can a binary belief be justifiably inferred from a graded belief? Can a binary belief be justifiably formed based on an experience that assigns degrees of confidence? What is the epistemology of inferring from a precise graded belief to an imprecise graded belief then to another precise graded belief?

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